

B-17 in action



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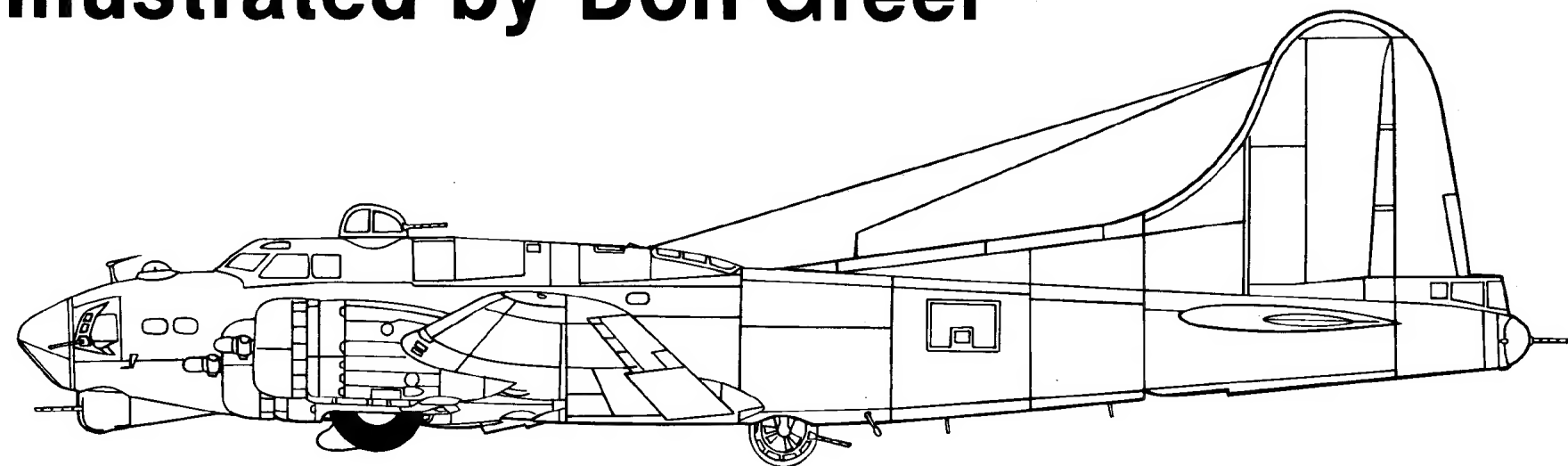
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B-17 in action

by Larry Davis

illustrated by Don Greer



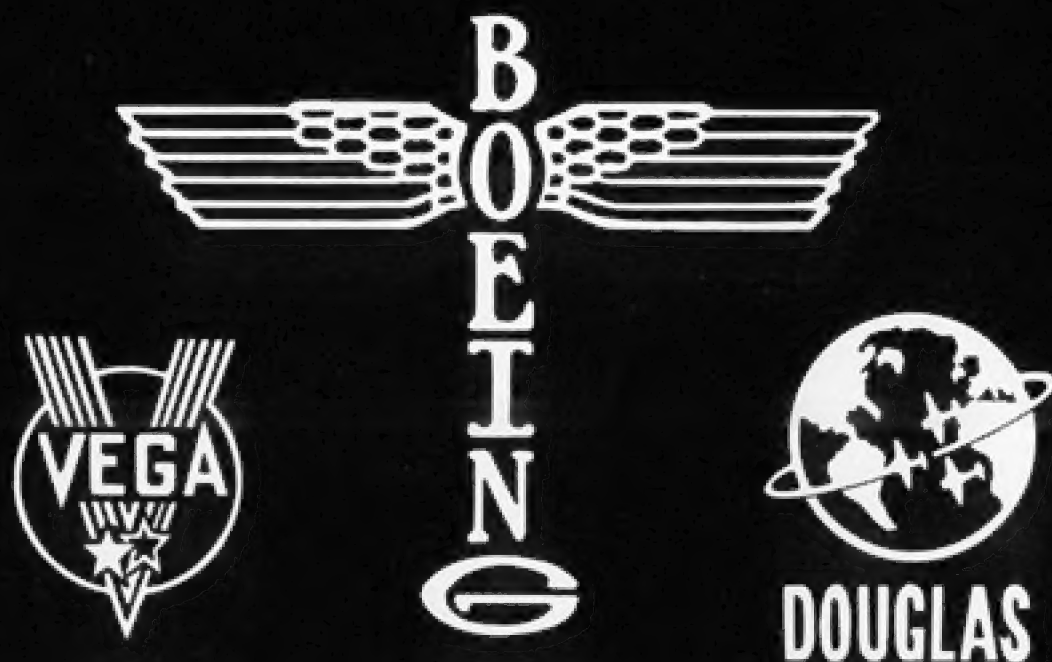
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"BOMB BOOGIE", a B-17F-15-VE, and "MEMPHIS BELLE", a B-17-10-BO, unload their bombs on Wilhemshaven—22 March 1943.



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DEDICATION

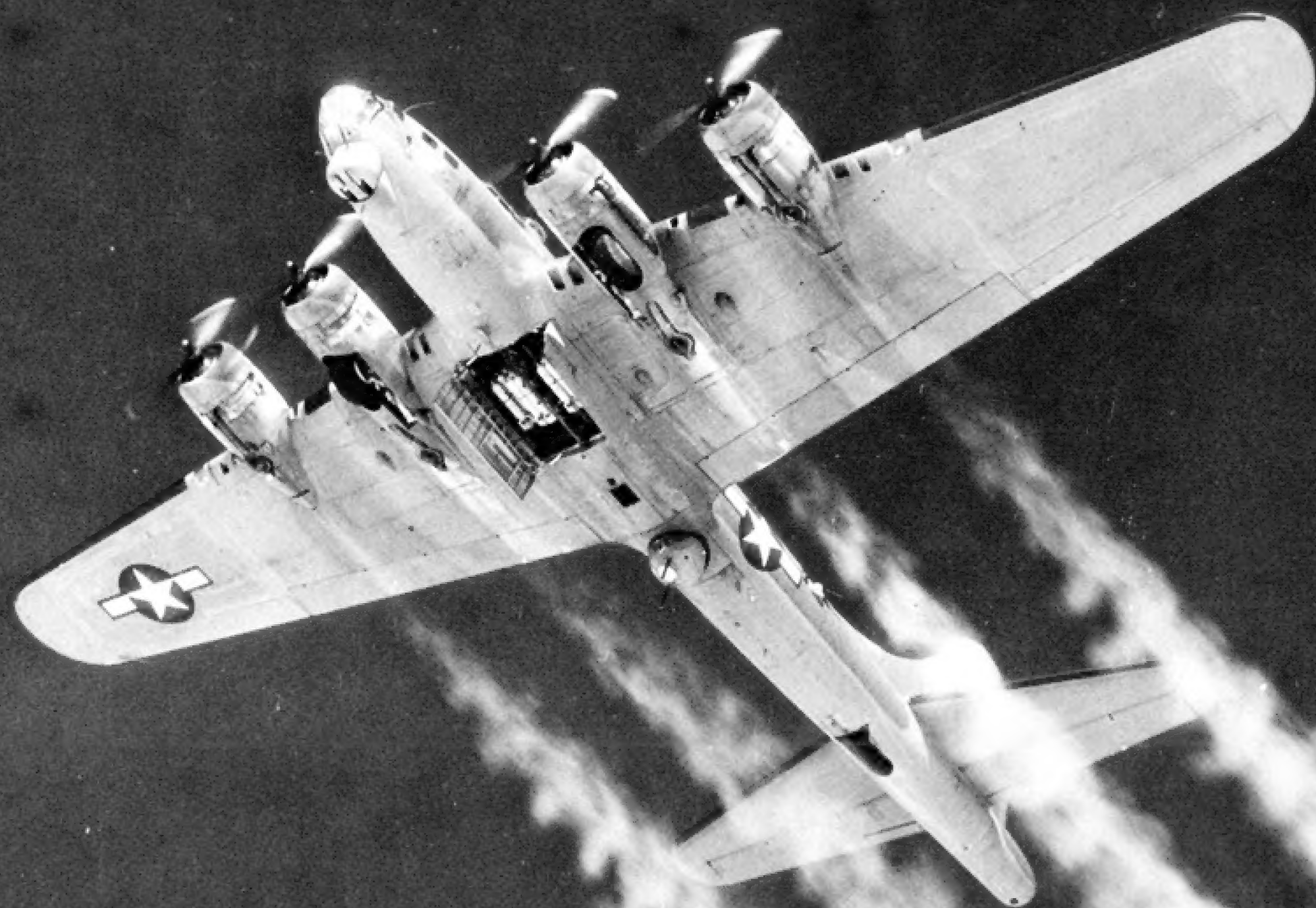
This book is dedicated to the men and women at the Air Force Museum, who constantly strive to keep the rich aviation history of this great country from being forgotten. To Colonel Richard Uppstrom, Royal Frey, Jack Hilliard and Chuck Worman — who constantly face the wrath of the politicians. To Viv, Cathy, and Bobbie — who have helped more people than they will ever know. To Howard Longberry and his crew of magicians in Restoration that many times end up creating something from nothing. To all these people, we historians say THANKS!

LIST OF CONTRIBUTORS

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The "queen of the skies" about to make some adjustments to Hitler's 1000 Year Reich.(AFM)



INTRODUCTION

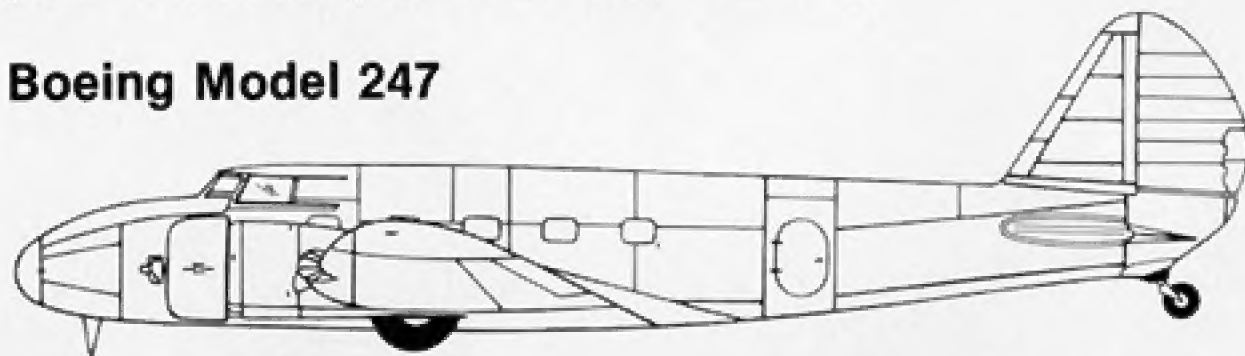
They called it Model 299. That's all! No nickname — not even an official designation. A wholly company funded project. An idea to build a long range bomber aircraft based on the Boeing Model 247 airliner. No one really wanted it. After all, what did the US need a long range bomber for? Weren't there two very big oceans between the US and the rest of the world? And the US Navy had control of both of those. Even if a foreign power bought the Model 299 design, or built one similar to it, even this bomber's long range meant a one way trip from European or Pacific bases to any target in the US, with not enough fuel to get back to their home base. And even the Japanese were not crazy enough for one way suicide missions.

Boeing was one of the oldest aircraft companies in the United States. William Boeing built his first airplane in 1916 — a single engine floatplane. The Boeing Airplane Company was officially organized on April 26, 1917, just in time for the end of World War One. The US Navy bought fifty Boeing Model C floatplanes during the war, which made the company an overnight success. The company's first bomber aircraft was the Curtis-designed, Boeing-built HS-2L, a floatplane design which could carry a pair of 230 lb depth bombs under the wings for use against enemy submarines.

After the end of World War One, the aircraft industry in general, and military manufacturers in particular, suffered much from the post-war niggardly government buying policies. Boeing managed to stay alive only by underbidding several other manufacturers on major military contracts, even though Boeing was not the designer of the product. It was Boeing that built two hundred MB-3A pursuit planes for the Army, an aircraft designed by the Thomas-Morse Aircraft Company. And it was Boeing that rebuilt and modified 298 DeHavilland DH-4s, again for the Army.

Boeing's first venture into the really big airplane business was with the Boeing Model 80 transport aircraft in the late 1920s. In 1930, Boeing introduced the Model 200 "Monomail", which revolutionized the industry with its all-metal wings, aluminum square truss spars, retractable landing gear, and engine cowling. In 1932, Boeing unveiled the Model 247 airliner which obsoleted all other transport aircraft in the world. United Airlines immediately ordered sixty of the new airliners. Of course, it helped that United Airlines was directly connected to Boeing through the United Aircraft and Holding Company. It was the cash generated by sales of the Model 247, and the ingenuity of Mr. Edward C. Wells, that would ultimately lead to the Model 299 prototype.

Boeing Model 247



Army Air Corps Circular 35-26 was the document that called out the specifications required by the Army in their new multi-engine bomber aircraft. It called for, among other things; a top speed of 200 to 250 mph at 10,000 feet altitude; a cruising speed of from 170 to 220 mph at 10,000 feet altitude; an endurance (range) of six to ten hours at cruise speed and altitude; plus a service ceiling of 20,000 to 25,000 feet. The number of engines meant by 'multiple' was not specified, although no one had built a bomber aircraft with more than two engines.

On July 17th, 1935, the Boeing Model 299 was rolled out of the Boeing factory in Seattle, Washington. It was Boeing's answer to Circular 35-26. All of the competing companies would build twin-engine aircraft to meet the new Army specs. Boeing was already involved in building the world's biggest aircraft, the XB-15 Very Long Range Bomber. Model 299



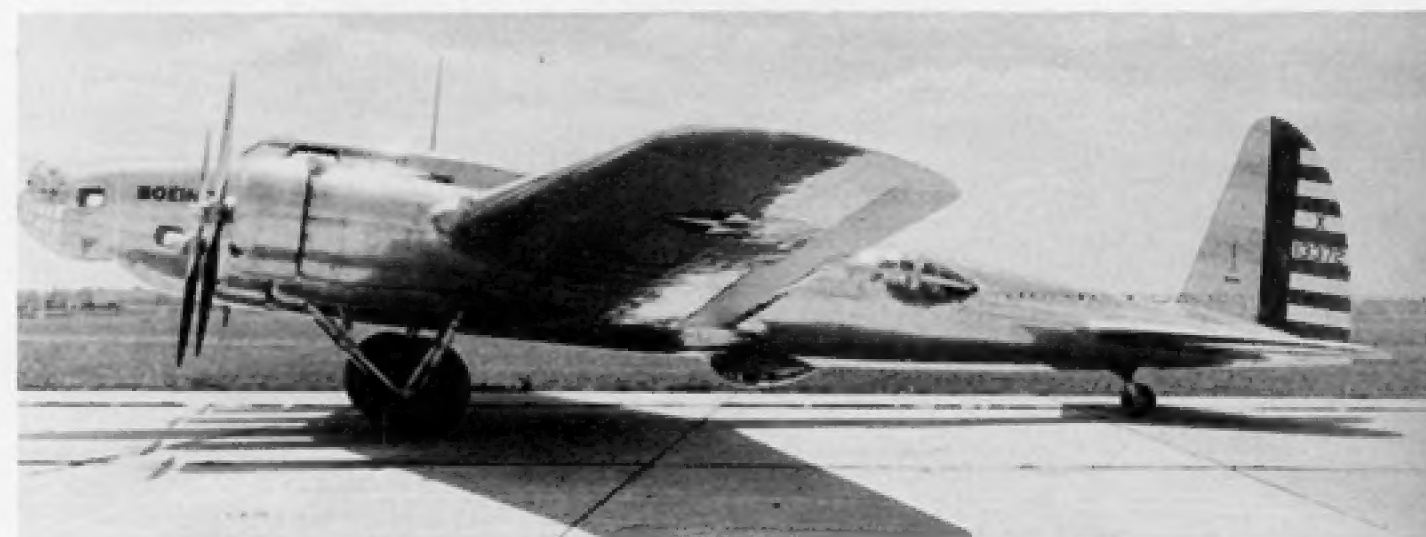
The team responsible for the Boeing Model 299. Edward C. Wells, head of the design team, is third from right.(AFM)

was designed using the basic fuselage design of the Model 247 airliner mated to the wing and engine layout of the gigantic XB-15, but in a much reduced size.

The Model 299 incorporated many new features, including an all metal monoplane wing structure with tubular truss spars; retractable landing gear, including the tail wheel; side by side enclosed cockpit, fully cowled engines with controllable pitch, constant speed propellers; multiple disc air brakes; and a fully enclosed internal bomb bay with electrically operated bomb bay doors. And of course, the Model 299 had four engines instead of the two that were normally found on other bomber aircraft. The four engines that the Model 299 used to meet the requirements of Circular 35-26 were single-row, seven cylinder, non-supercharged Pratt & Whitney R-1690 Hornets, rated at 750 horsepower each. The endurance factor was met by four welded aluminum fuel tanks mounted in the wings between the spars, totalling 1700 gallons of fuel.

The Model 299, with gun blisters "everywhere you looked", was called Boeing's "aerial battle-cruiser". One newsman covering the rollout ceremony called it the "Flying Fortress" — the name stuck. Model 299 took to the air for the first time on 28 July 1935 after extensive ground testing. On 20 August 1935, the B-299 made the long flight from Seattle to Wright Field, Ohio, for the official bomber competition. The distance was 2100 miles and the B-299 covered it in slightly over nine hours, averaging 233 mph, easily surpassing the cruising speed and range requirements of Circular 35-26. At Wright Field, the actual competition was no competition at all, the B-299 easily out performed both of its com-

Model 299 was rolled out on 17 July 1935. The cut-out in the lower part of the nose is for the bombardier's window. X 13372 on the rudder indicates that the aircraft is still a civil aircraft registered to the Boeing factory.

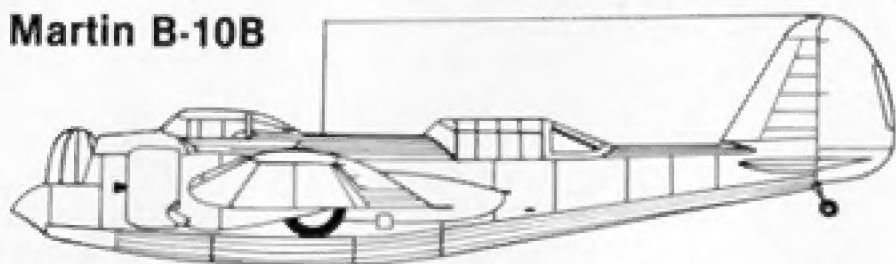


petitors — a modified Martin B-10, and the Douglas DB-1, a bomber version of the successful Douglas DC-2 transport aircraft. Boeing's factory funded gamble on four engines powering had paid off.

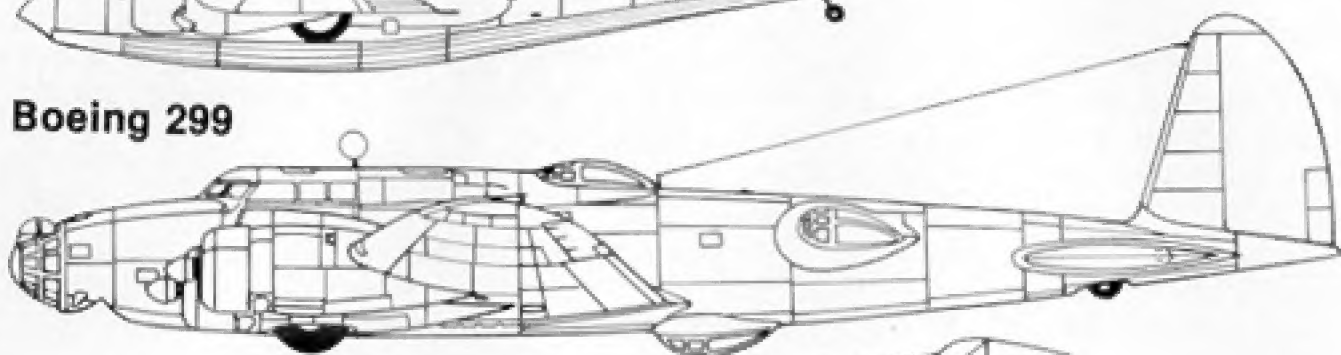
With the competition in hand, and a contract certain to be coming from Army Air Corps, disaster suddenly struck the B-299 project. One of the new features that was incorporated into the B-299 design was an internal control lock on the flying surfaces. These locks kept the flying surfaces, i.e. flaps, rudder, ailerons, etc., from moving and causing possible damage during ground winds. Unfortunately, on 30 October 1935 the flight crew neglected to unlock the controls prior to one of the final test flights at Wright Field. The locked controls caused a reverse effect on the flight. As the pilot pulled back on the control wheel to gain altitude, the B-299 did the exact opposite. It crashed just off the Wright Field runway killing Army Air Corps pilot Major Ployer Hill, and Boeing's Chief Test Pilot Leslie Turner. The crash not only cost the lives of the two pilots, and scrapped the B-299 prototype, but it also cost Boeing the Army Air Corps promised contract for 65 aircraft. However, Army Air Corps' did order thirteen test models of the B-299 design, which were enough to keep development moving.

1935 Bomber Competition

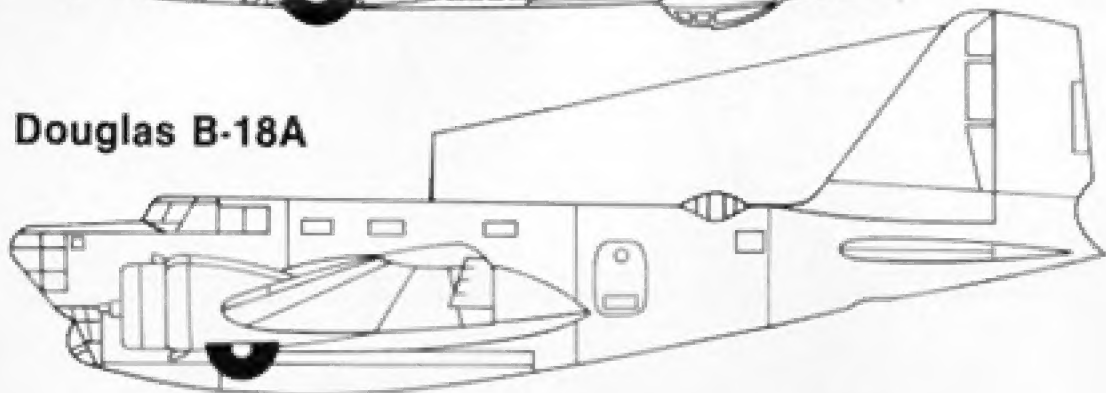
Martin B-10B



Boeing 299



Douglas B-18A



YB-17/Y1B-17

Boeing was awarded an Army contract to build thirteen of the new bombers on 12 January 1936, under the designation YB-17. The designation was later changed to Y1B-17 because of a change in funding of the aircraft. There were no internal or external changes between the YB-17 and the Y1B-17. However, the Y1B-17 differed from the original B-299 in having the more powerful Wright R-1820-39 'Cyclone' engines, rated at 850 horsepower. Additional changes included: redesign of the landing gear from a dual oleo style to a single oleo to facilitate changing the main wheels and tires; fabric covered flaps in place of the original metal ones; the crew was reduced to six; and the oxygen system was modified. Further changes included additional fuel tanks, de-icer boots, instrumentation and ammunition supply changes.



On 30 October 1935, Model 299 crashed at Wright Field destroying the aircraft and killing both an Army test pilot and Boeing's Chief Test Pilot. The crash was attributed to the failure of the crew to unlock the flight controls before taking off. Although the Model 299 easily won the 1935 bomber competition, the crash caused Army to award the new bomber contract to Douglas for the DB-1 (B-18). (AFM)



Although the gigantic XB-15 did not fly until twenty-six months after the Model 299, the design work had begun on the Model XB-15 several weeks before that of the Model 299, resulting in a great similarity in the two aircraft. (AFM)

A Y1B-17 of the 49th BSq during the Summer of 1938. The major differences between the B-299 and the Y1B-17 included new intake/exhaust fairings atop the nacelles, and new landing light fairings in the wing leading edge. Note the three-color cowl rings indicating a squadron commander's aircraft. (Schmelzer via Garrett)





A 49th BSq Y1B-17 clearly showing the bombardier's window cutout and the nose gun bubble. The entire nose perspex rotated 360 degrees in order to bring the turret gun to bear on targets attacking from below. (Schmelzer via Garrett)

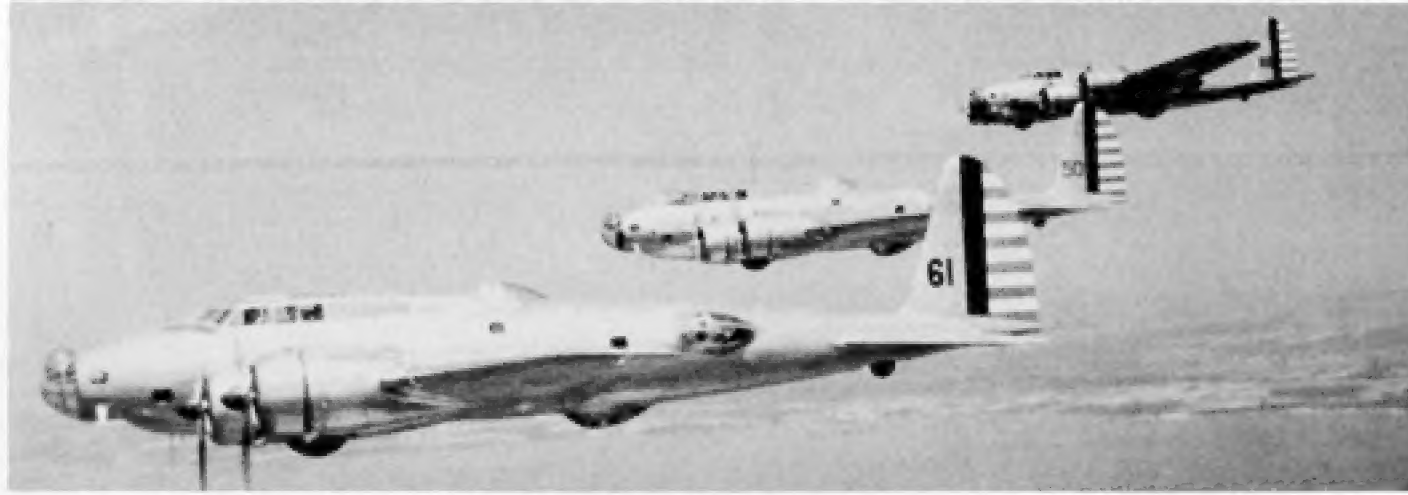
A Y1B-17 of the 25th BSq. The two colored bands around the fuselage, are repeated around the right wing, and indicates a squadron commander's aircraft. Note the Douglas B-18As in the background. (Schmelzer via Garrett)

The early B-17 program was trouble-plagued and almost cost Boeing its financial life. The Wright Cyclone engine was very sensitive to heat and suffered many engine failures. Braking problems caused by overheating also occurred frequently. On 7 December 1936, both problems appeared on one fateful flight. On the third flight of the first Y1B-17 several things happened which resulted in the crash of the aircraft. First the pilot used the brakes excessively during the taxi roll. Then he retracted the landing gear immediately after takeoff instead of allowing the brakes to cool down in the airstream. When two of the engines overheated, the pilot made an emergency landing back at Boeing Field. But, the brakes had welded themselves to the rotors which would not allow the wheels to rotate on the axles. As soon as the aircraft touched the ground, it immediately nosed over, plowing up the runway. Although no one was injured, Congress almost decided that the big bomber was too much for a pilot to handle. Although Congress did not cancel the B-17 contract, the accident did result in the purchase of an additional 253 Douglas B-18s, the aircraft that had 'won' the bomber contract of Circular 35-26 after the crash of the original B-299.

It seemed that no one wanted the B-17 - no one except GHQ Air Force, who set up a public relations campaign to improve the image of the B-17. Several headline grabbing flights were flown including two to South America. Transcontinental speed records were broken several times, and load carrying record flights were also flown. Between this extensive PR campaign, and the gathering of storm clouds over both Europe and the Pacific, both the public's and congressional eyes began to see the B-17 in a different light. The result was an additional order for 119 B-17B through B-17D aircraft.

The turbo-supercharger concept had been around since the end of World War One, but it would be the Y1B-17A that would make the idea truly workable. The reason that development of the turbo-supercharger lagged behind that of contemporary aircraft design was simple — most aircraft were designed to fly at altitudes where a turbo-supercharger was not needed. In the late 1930s, with fighter aircraft performance and armament increasing greatly, bomber aircraft began operating at ever higher altitudes. At these altitudes a normally aspirated, or non-supercharged engine did not perform well. The turbo-super-





The first three aircraft received by the 2nd BGP at Langley Field. The 2nd BGP was the first unit to operate the Y1B-17. All three squadrons, the 20th, 49th, and 96th BSqs, received one aircraft each, as seen in this photo. (AFM)

charger was the answer. The Y1B-17A was to be the testbed.

The fourteenth Y1B-17 airframe was originally slated to be the structural testbed aircraft for the B-17 series. This requirement by Army Air Corps was lessened greatly when a standard flight-test Y1B-17 was caught in a violent thunderstorm during a regular test flight. The data obtained during this freak test indicated that the airframe would easily pass the structural tests slated for the 14th airframe. Thus Boeing, and the Air Corps, gained a 14th flight test aircraft, Y1B-17 serial 37-369 — that could be used as a test bed for the turbo supercharger. With this major change in the powerplants, the aircraft was redesignated the Y1B-17A.

The first experimental turbo-supercharger was installed on the top of the engine, necessitated by an Army requirement that the exhaust should exit on top of the engine nacelles. So badly was the airflow over the wing interrupted by this design that extreme buffeting occurred whenever the turbo-superchargers were cut in. Boeing engineers re-routed the exhaust around the main landing gear so that the turbo could be moved to the underside of the nacelle. The conversion was completed by 21 October 1938, and the first flight occurred on 20 November of the same year. On 31 January 1939, the Y1B-17A was returned to Wright Field where tests revealed some astonishing results. The turbo-superchargers increased the service ceiling from 31,000 feet to 38,000 feet, top speed was increased from 239 mph at 5,000 feet, to 271 mph at 25,000 feet. Power was so great at 35,000 feet that one engine could be shut down and the mission completed. The entire turbo supercharger project had again been completely company funded, for which the Army never re-imbursed Boeing. However, after all the work was done, the money spent, and the turbo-supercharger concept proved out, Army ordered that all further B-17 (and B-24) aircraft would have turbo-supercharged engines.

Twelve of the original thirteen Y1B-17s became the 2nd Bomb Group, the only four engine bomber group in the Army Air Corps. It was three aircraft from this group that flew the famous mission intercepting the Italian luxury liner Rex in May of 1938, thus proving to all disbelievers that the B-17 could reach nearly any target, attack it, and then return home. The Lead Navigator on this famous flight was an unknown Army Lieutenant named Curtis LeMay. So successful was the mission that Naval Headquarters feared the aircraft might obsolete naval defenses of the country. Navy asked for, and received, permission to ban all future B-17 flights out to sea — that was Navy territory! Regardless, the era of the long range, heavy bomber was at hand.

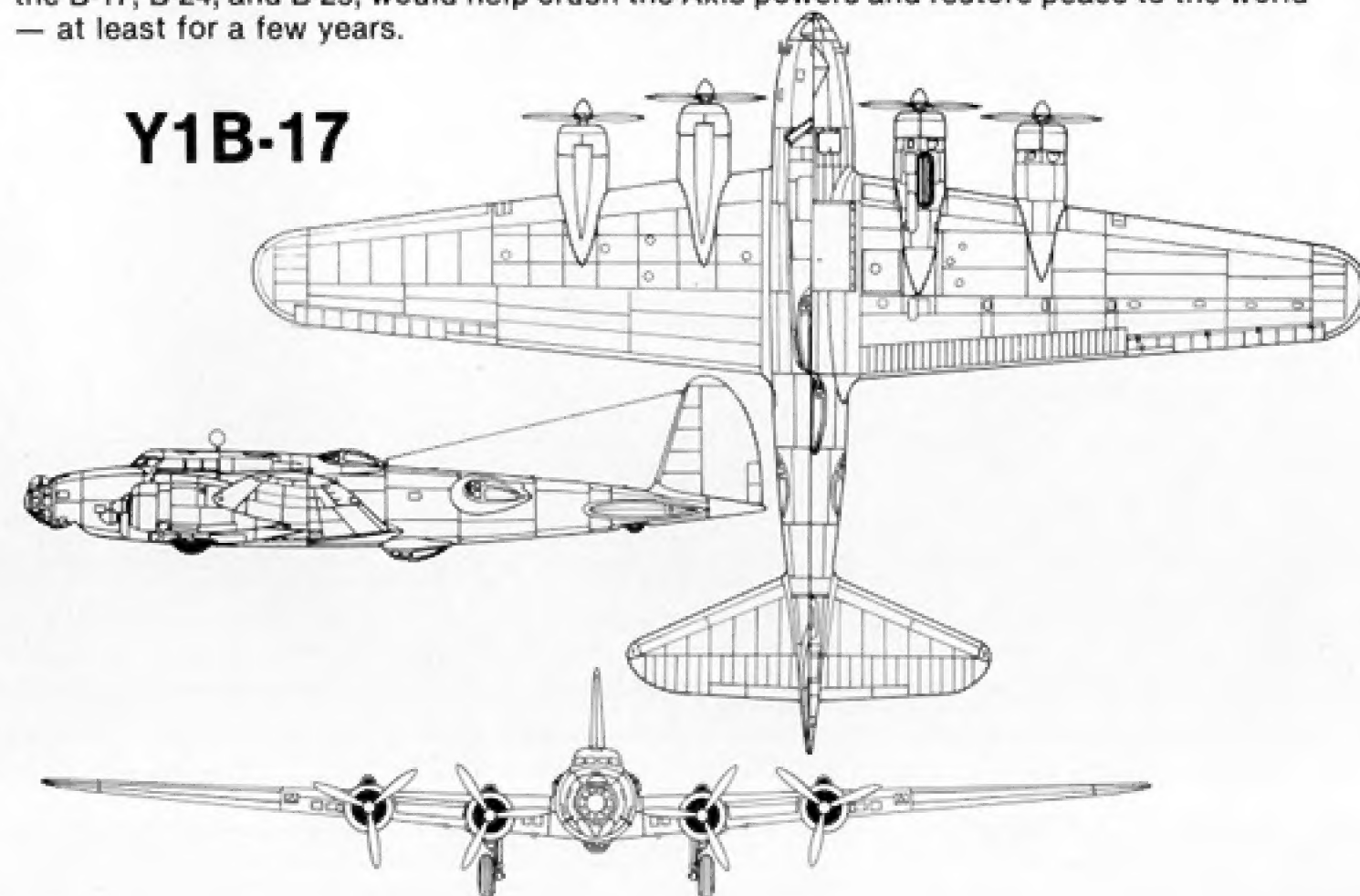
The story of the B-17 aircraft would not be complete without reference to the single piece of equipment that made the aircraft so effective in later years over European targets. That piece of equipment was the Norden bombsight. Carl Norden is credited with the invention of the modern bombsight as we know it. Before the bombsight, Norden had been active in military circles and invented such things as robot flying bombs and the catapult and arresting gear used on the first aircraft carriers USS Saratoga and Lexington. In 1921, the Navy asked him to study the problems of precision bombing and come up



A 20th BSq Y1B-17 in the three tone Brown and Green camouflage used in the 1939 war games. The underside was Pale Blue.

with a bombsight. Six years later Norden presented his first bombsight.

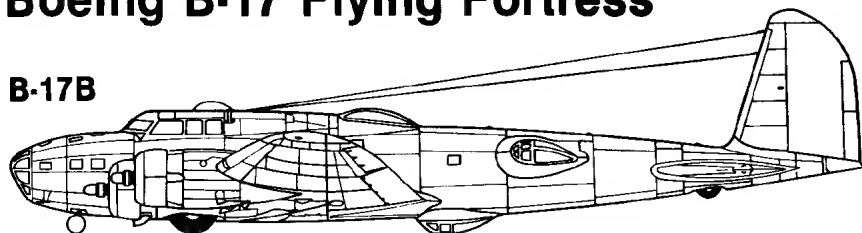
The bombsight itself was a collection of gyros, gears, mirrors, and knobs that all worked together to put a bomb on a target. The bombardier looked into the sight at a target area lying well ahead of the aircraft. This gave the illusion that the aircraft was not moving in relation to the target. The bombardier adjusted the course of the aircraft to bring it straight over the target. Then he locks the crosshairs onto the target and dials in the speed and altitude of the aircraft. The mirror then moved at a speed synchronized to that of the aircraft so as to keep the crosshairs on the target. The bombardier then dialed in the ballistic data of the weapons being dropped. This all worked together to tell the bombsight the exact point where the bombs should be released to put them on the target. From that point on it was automatic! The bombsight was tied into the autopilot and made its own course corrections. At the exact point computed by the sight, the bombs were automatically released. It may sound simple, but it took the Army eighteen weeks to train men to operate the \$6,000.00 bombsight. The Norden bombsight, installed in aircraft like the B-17, B-24, and B-29, would help crush the Axis powers and restore peace to the world — at least for a few years.



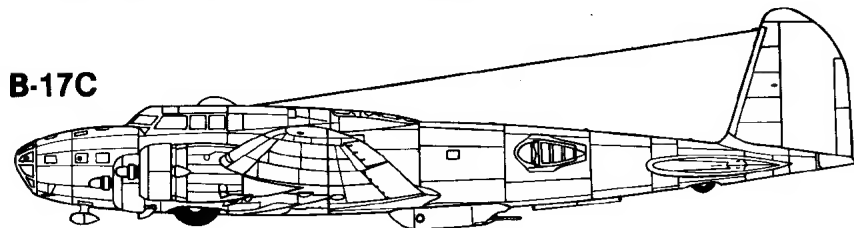
Developments

Boeing B-17 Flying Fortress

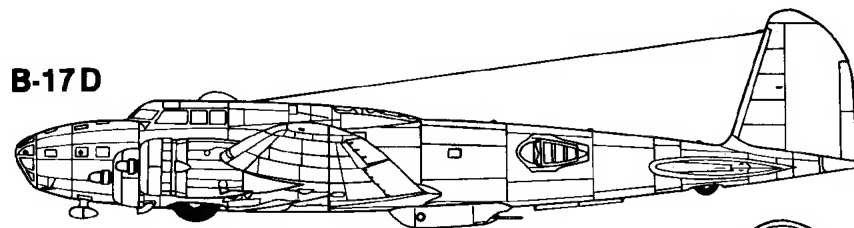
B-17B



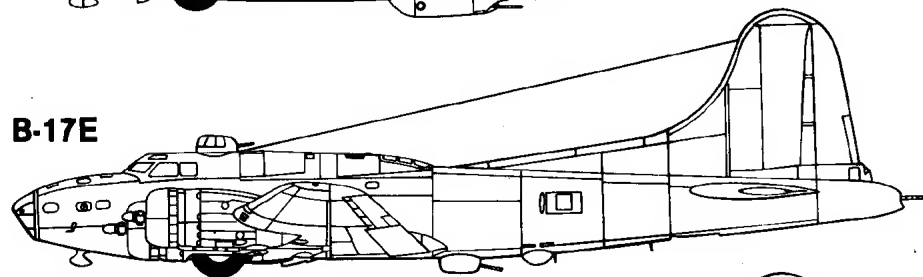
B-17C



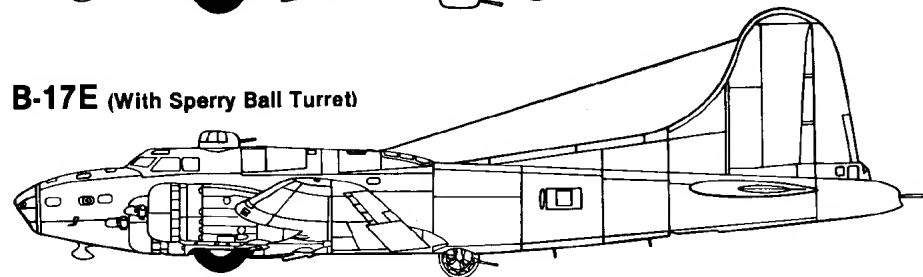
B-17D



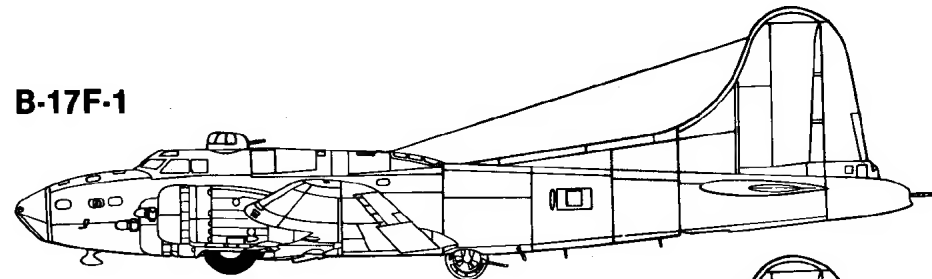
B-17E



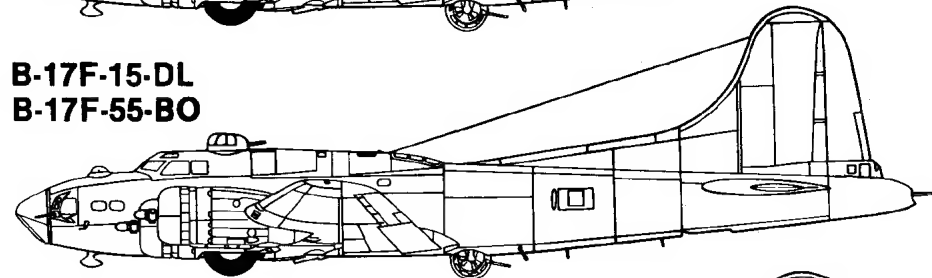
B-17E (With Sperry Ball Turret)



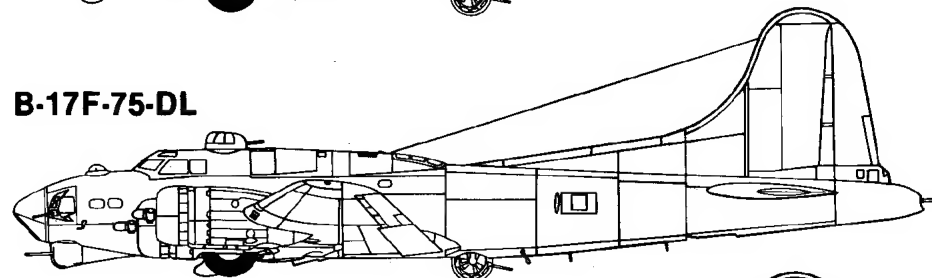
B-17F-1



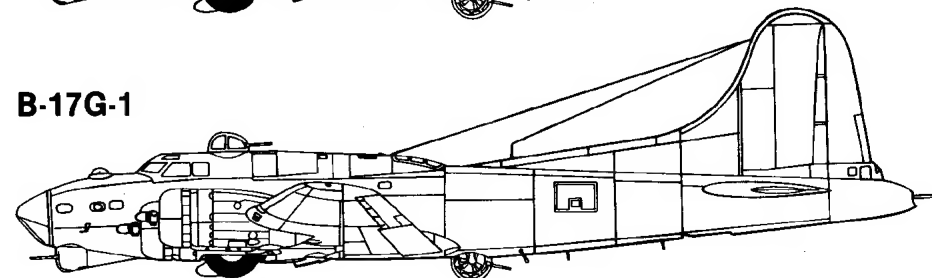
**B-17F-15-DL
B-17F-55-BO**



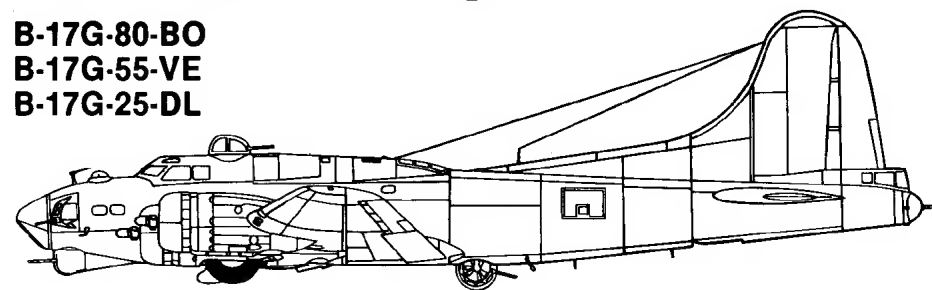
B-17F-75-DL



B-17G-1



**B-17G-80-BO
B-17G-55-VE
B-17G-25-DL**



B-17B

On 3 August 1937 a contract was issued for ten of the improved B-17Bs. Improvements included the turbo supercharger that had been tested on the Y1B-17A, a larger rudder, fuel system changes and a redesigned nose area. The nose cone with its rotating machine gun bubble was replaced with an all new multi-piece plexiglass nose cone with several ball and socket machine gun mounts. A large aircraft commander's observation bubble was added to the top of the rear of the cockpit area. The notched out area for the bomb aiming window on the lower forward fuselage was faired over and the bomb aimer's position was moved to a flattened panel in the nose cone. The DF loop was moved from just above the cockpit to a position on the chin. Because of the B-17s range the navigator was given a position of his own; the Y1B-17 having had a combination bombardier-navigator.

The first B-17B was delivered on 20 October 1939 and on 30 March 1940 the last of the 39 B-17Bs finally was delivered to the Army. Additional aircraft added to the original contract brought the cost per aircraft down from \$274,000 to \$207,150. None of the B-17Bs would see combat service during World War Two. However many late improvements in the B-17 series were tested and proven on the B series. Some of the late B-17Bs were externally indistinguishable from the later C and D series since many of the latter's improvements were incorporated into the B series. The last B-17B was retired on 1 January 1946.

The introduction of the B-17B in June of 1939, saw the first use of the now famous turbo-supercharger on a production aircraft. An all-new nose perspex and a commander's bubble atop the cockpit area were introduced on the B-17B. (AFM)



A lineup of B-17Bs at Langley Field during the Summer of 1941. The Yellow and Black checkered cowl B-17B, from the 38th Reconnaissance Squadron, has had B-17C style waist windows retrofitted. (AFM)





A 2nd BGp B-17B sits on the ramp at Langley Field in front of a lineup of 2nd BGp B-18s. The 2nd BGp was equipped with every major type of bomber aircraft in the Army Air Corps. The commander's bubble on the B-17B can be seen behind the cockpit. (Schmelzer via Garrett)

Loop DF Antenna

Machine Gun

Y1B-17

Bomb Aimer's Window

Commander's Dome

B-17B

Bomb Aimer's Window

Loop DF Antenna

Y1B-17

B-17B

Y1B-17

Scoop

Exhaust

B-17B

Scoop

Exhaust

B-17C/D

Visible changes between the B-17B and the B-17C were mainly in armament. All the streamlined gun blisters were removed. The waist guns were mounted on pedestal mounts inside the fuselage with the blisters giving way to flush teardrop-shaped windows through which the guns were fired. The top gun blister gave way to a stepped plexiglass fairing that slid back to uncover the upper gun. The lower blister was changed to a large tub-like affair, with the gun firing down and to the rear. Unfortunately the gunner had to kneel while firing, making him extremely uncomfortable, which led to poor accuracy. The weapons themselves were changed from .30 to .50 caliber machine guns in all positions except the nose. A football antenna replaced the loop antenna on the chin.

The Army contracted for eighty B-17Cs with the first aircraft flying on 21 July 1940. In the event only 38 C models were built — twenty for the RAF under the designation Fortress I, and 18 for the US Army Air Corps. Deliveries of the B-17C were staggered — a few for the RAF, then a few for the US Army, a couple more for the RAF, etc. All the C models were delivered by November of 1940 but it would not be until March of 1941 that the first aircraft would arrive in England. Due to being below RAF standards of defensive armament the Fortress Is serving with the RAF were relegated to the training role. However, on 8 July 1941, the RAF sent three Fortress Is on a high altitude test strike on Wilhelmshaven. Several other test strikes were carried out against European targets with the RAF's initial concerns about the American aircraft being confirmed. The Fortress could fly much higher than any British bomber type then in service, but not higher than defending Luftwaffe fighters. And the light defensive armament and armor of the Fortress made them extremely vulnerable. Along with this, many systems froze up due to the extreme cold at the higher altitudes. Although much was learned from these early strikes, the problems would not be ironed out until the introduction of the B-17E. The RAF soon relegated their Fortress Is to Coastal Command for long range anti-shipping and submarine patrols.

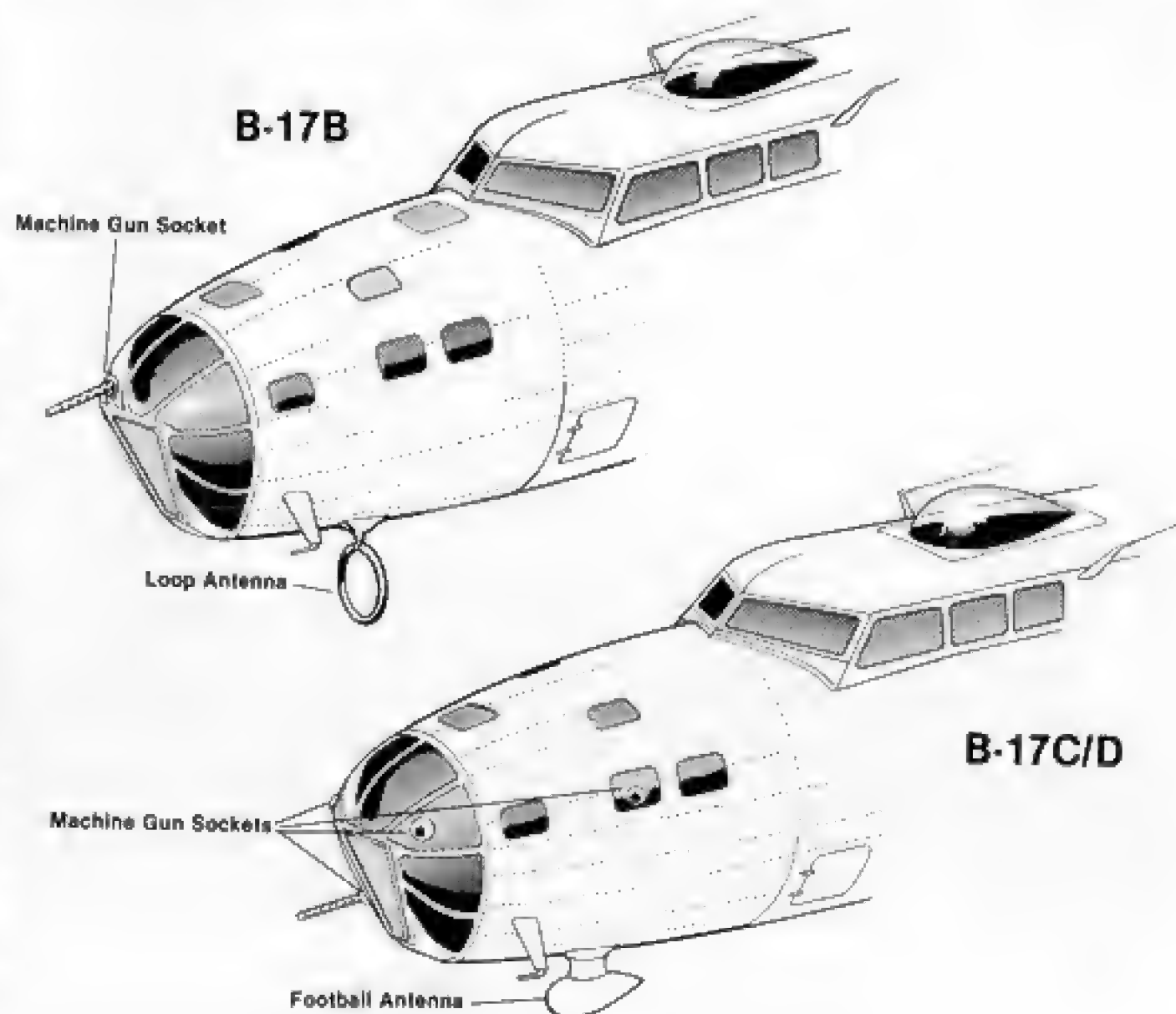
The contract called for a further forty-two aircraft but so many changes were incorporated into the design that Army redesignated these last aircraft B-17Ds. Externally, they could be distinguished from the C model by the addition of engine cowl flaps and twin upper and lower gun mounts instead of the single gun mounts in the C. Internally, changes included more armor plate for crew protection, self sealing fuel tanks, redesigned bomb racks and release mechanisms, and a low pressure oxygen system. Additionally, the entire electrical system was changed from twelve volt to twenty-four volt.

The first B-17Ds were delivered on 3 February 1941, with the entire contract run coming off the Boeing assembly line by 29 April 1941. Over 75% of the delivered aircraft would be sent to the Hawaiian Islands and the Far East in a show of force to the Japanese. On 21 May 1941, 21 aircraft flew to Hickman Field, Hawaii, where they were assigned to the 5th Bombardment Group (Heavy). In September 1941, nine of these aircraft were transferred to the 19th Bombardment Group (Heavy), at Clark Field, The Philippines. In November of 1941, with war clouds darkening in the Pacific, an additional 26 aircraft, including some B-17Cs that had been brought up to B-17D standards, were added to the Clark force. On 7 December, when the Japanese attacked, there were 12 B-17s neatly lined up on the ramp at Hickam Field awaiting destruction at the hands of the Japanese pilots. Additionally, twelve unarmed B-17Ds from the 7th BGP began arriving over Hickam during the attack. Three hours later, most of the Hickam force had been destroyed. Of the arriving 7th BGP aircraft, only one Fortress was destroyed, but all were damaged, either by Japanese fighters or by American anti-aircraft fire. Nine hours after the attack on Pearl Harbor, the Japanese attacked The Philippine Islands, including Clark Field. And although fully alerted to the Pearl Harbor attack, the Clark Field force was virtually destroyed on the ground. Eighteen of the B-17s were destroyed. Loss of the entire B-17 force in the Pacific would have been complete had not the 14th Bombardment Squadron been transferred to Del Monte, a small auxiliary field on Mindanao, some 600 miles to the south of Clark.

It was from this small group of men and machines that America's first heroes of World



A B-17C assigned to the Wright Field Air Development Center in 1941. The B-17C introduced flexible gun mounts in open window areas at the dorsal and waist gun positions, plus an armored 'tub' in the ventral gun position. (AFM)



War Two would come. These men would carry out the first offensive strikes by American airpower of the war. On 9 December, B-17s of the 19th BGP began flying reconnaissance missions from Del Monte in an attempt to locate the Japanese invasion force. No contact was made. On 10 December, a large Japanese convoy was sighted near Aparri, off the coast of Luzon. Five B-17s took off from Del Monte and attacked the convoy from a 12,000 foot altitude. These B-17s dropped the first bombs by American aircraft in World War Two. Several hits were observed but no ships were sunk.

During the previous night, several B-17s had staged to Clark Field where they were refueled and armed for a second attack on the convoy. Among them was the B-17C piloted by Captain Colin Kelly. Arriving over the invasion area, Kelly's crew observed several large warships bombarding the shoreline in support of the landings. At first Kelly ignored these targets and proceeded further out to sea in search of the Japanese aircraft carrier that they knew had to be there. After a fruitless search, Kelly turned the B-17 around and headed back to the invasion area. At 22,000 feet, they carried out a head on attack on a "Japanese battleship". Three bombs were dropped on the "battleship" with one striking the aft gun turret and setting the ship afire. Kelly immediately turned and began the run for Clark.

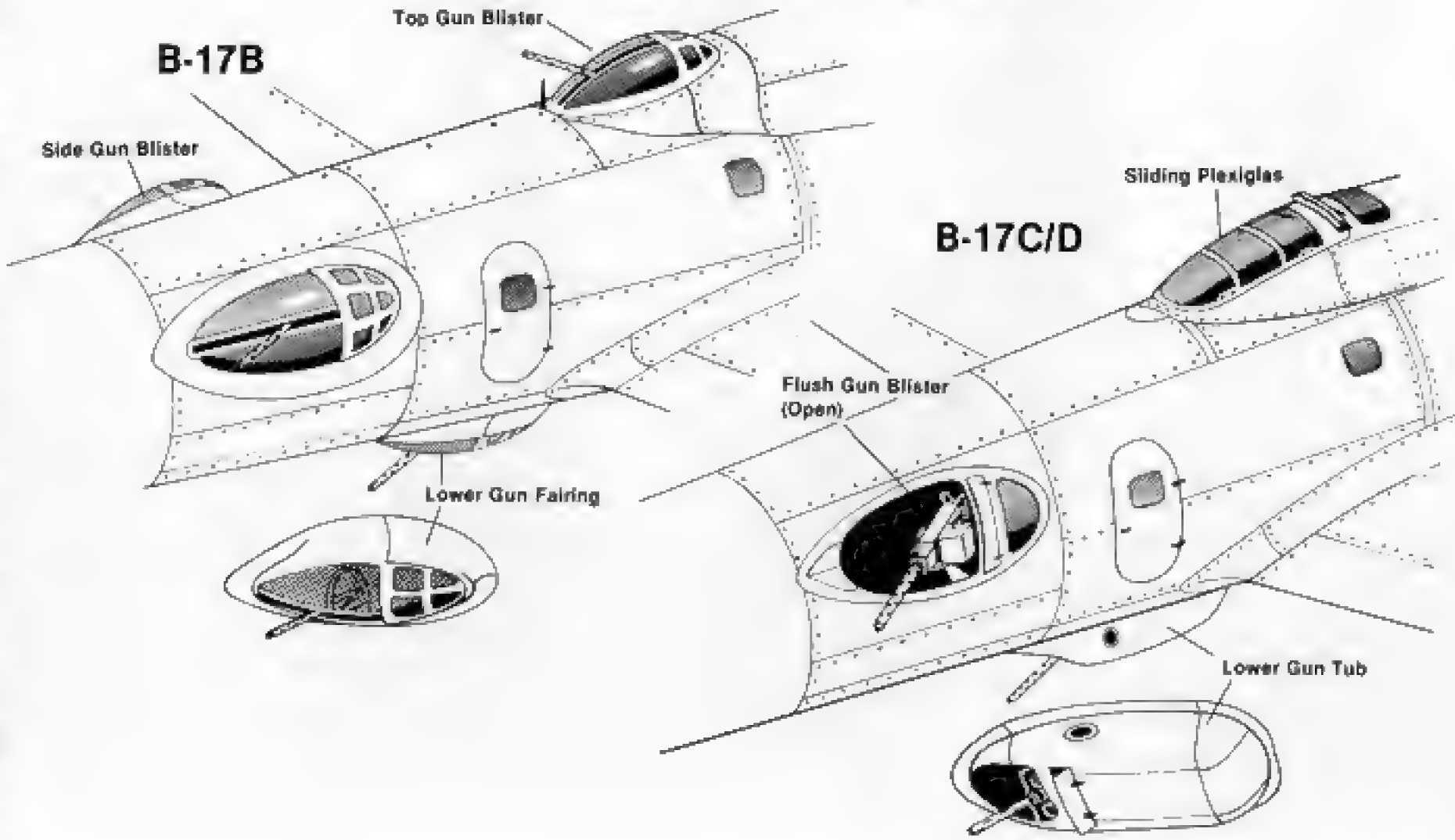
At 18,000 feet a group of Japanese Zero fighters were flying top cover over the invasion force, led by Saburo Sakai. The Zeros didn't even know that thier charges were under attack until the bombs struck the water and the ship. Sakai ordered the Japanese fighters to attack the fleeing B-17. About 50 miles from Clark the Zeros caught up with Kelly's B-17. After several attacks which knocked out the instrument panel, oxygen systems, and elevators, the B-17C finally caught fire in the bomb bay area. Kelly held the aircraft in level flight and ordered the crew to bail out. The aircraft blew up before Kelly could escape. The American people needed a hero and Colin Kelly was it. The Pentagon let the story out that Kelly and his crew had sunk the Japanese battleship Haruna, and Kelly had given his life to save his crew. In actuality, no Haruna class battleship was anywhere near The Philippines, and captured Japanese records show no ships being sunk on 10 December 1941. However, the deeds of Colin Kelly and his crew became legend in the United States. It was a badly needed spark to light the American people's fire at a time when defeat was everywhere. Kelly became an idol to wartime Americans, the first of many B-17 crew members to be so honored. The fact that a ship was not sunk in no way diminished the bravery of Kelly for his attack on the Japanese ship in the face of such overwhelming odds.

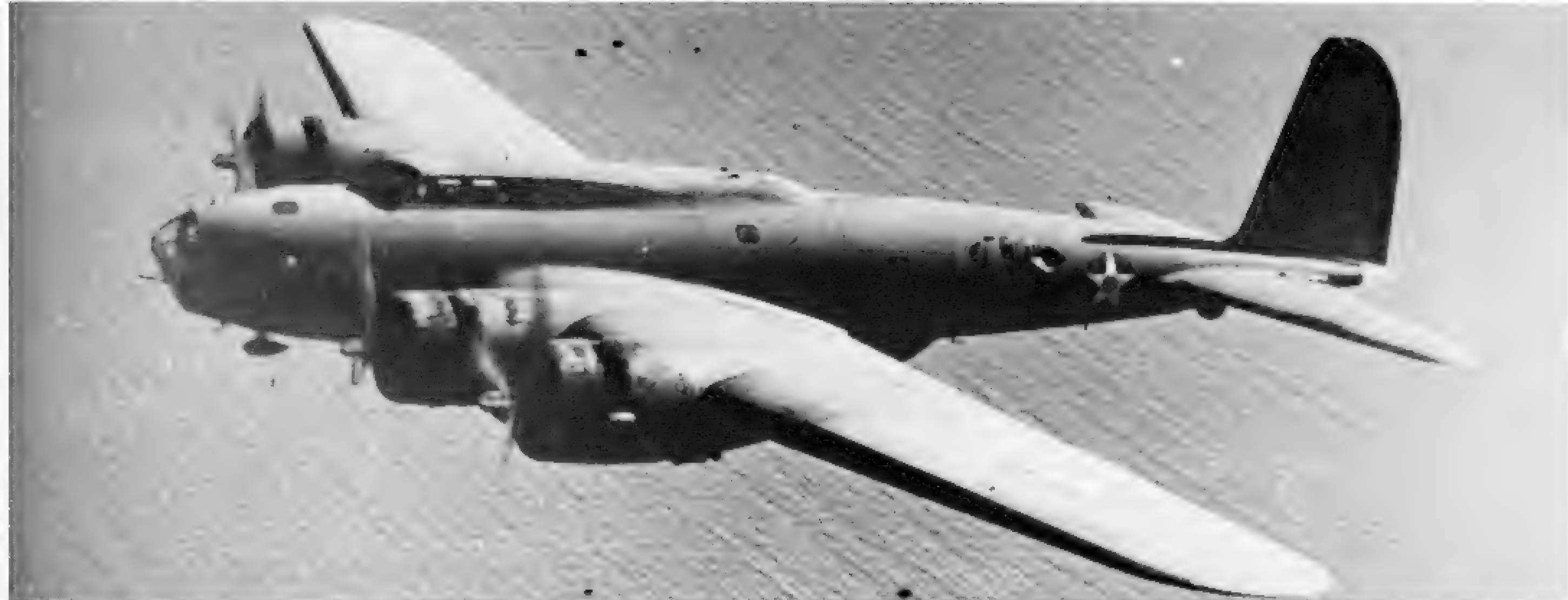
The B-17C/Ds were rapidly phased out of combat service in the Army Air Force in favor of the much more heavily armed and armored B-17E and F. By 1943, only one remained flying in a combat zone. It was "The Swoose" — a B-17D that had been resurrected from several shot-up B-17 wrecks at Clark Field. "The Swoose" became the personal transport of Lt General George Brett, commanding the bombing force in Australia, and flew continuously throughout World War Two. The remaining B-17C/Ds were relegated to training and patrol missions in the Continental US. They were redesignated RB-17 with the R standing for Restricted flight. Today, "The Swoose" remains and is awaiting restoration at the Smithsonian Air and Space Museum.



Fortress I AN-528, AAF serial 40-2064, was the 11th B-17C delivered to the Royal Air Force. Under the designation Fortress I, the B-17C was the first heavy US bomber to see action in the European airwar. Fortress Is were camouflaged in RAF Dark Green and Dark Earth upon arrival in Great Britain. (AFM)

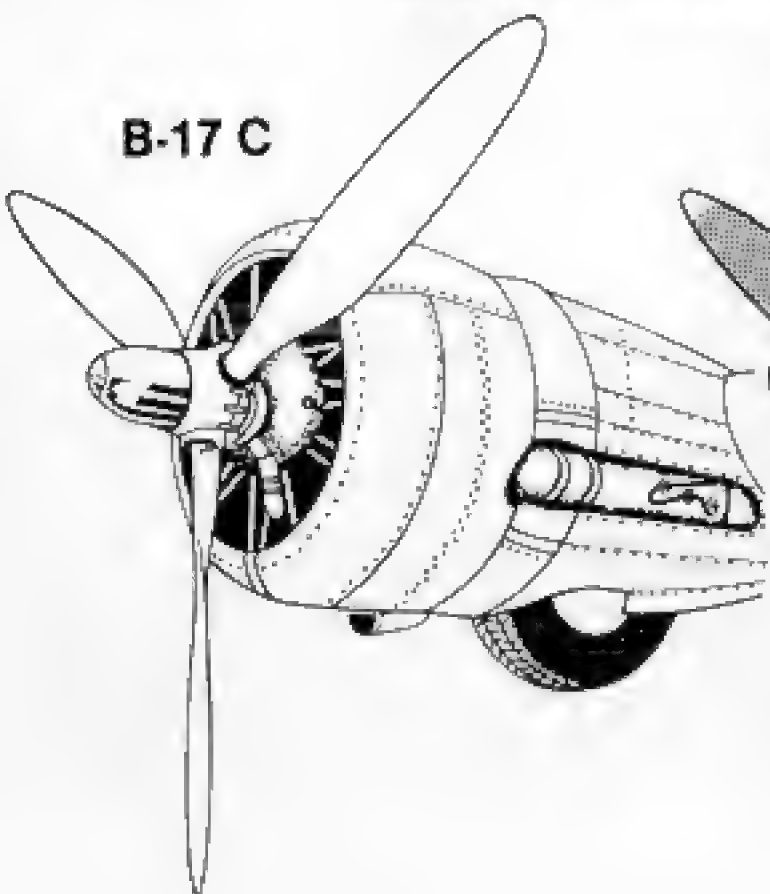
Armament Development



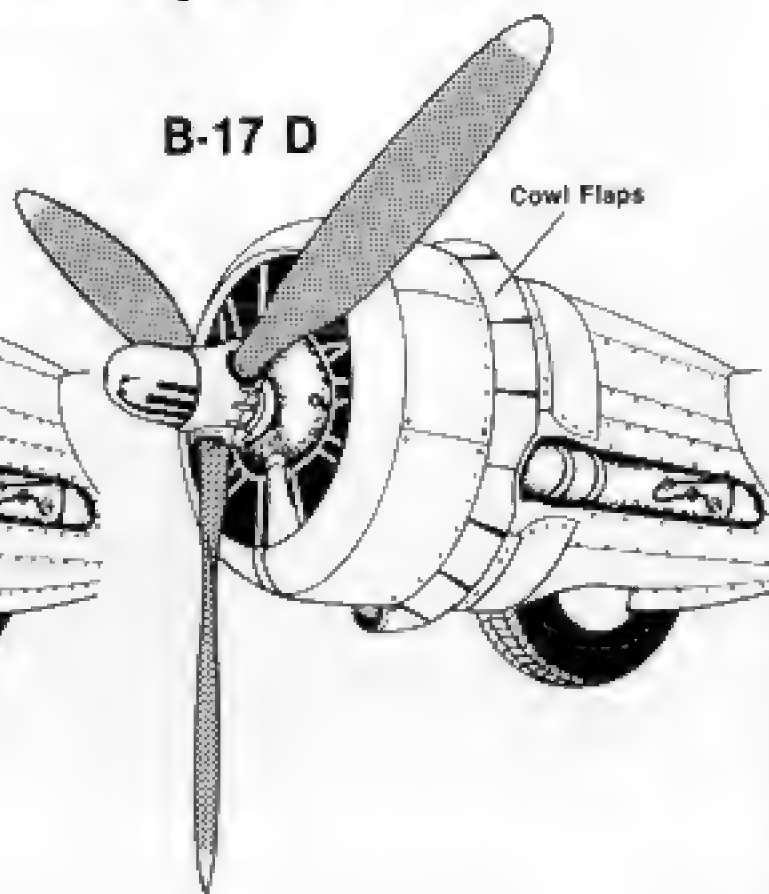


Cowl Development

B-17 C



B-17 D



A B-17D of the 7th BGp enroute to Hickam Field, Hawaii, during the Summer of 1941. Army Air Force aircraft were camouflaged in Olive Drab over Neutral Gray during the Spring of 1941. (AFM)

A B-17D on the Hickam Field ramp during the Summer of 1941. Note the crew entry door and flush plexiglas coverings over the waist gun positions. The B-17D had twin .50 caliber guns mounted in the belly 'tub' and dorsal positions. (AFM)



B-17E

The B-17E was the first of the really heavily armed Flying Fortresses that was capable of carrying the war to the German homeland. The B-17E incorporated a host of changes dictated by hard won lessons learned from RAF combat over Europe and the US Army in the Pacific after the Japanese attack on Pearl Harbor and the Philippines. The RAF found the Fortress I (B-17C) to be nearly defenseless during attacks from the rear, a point rapidly learned by both Luftwaffe and Japanese fighter pilots. The gunners were also hampered by the limited amount of traverse afforded to the top and belly gun positions. Defensive armament received the greatest amount of attention in the design of the B-17E.

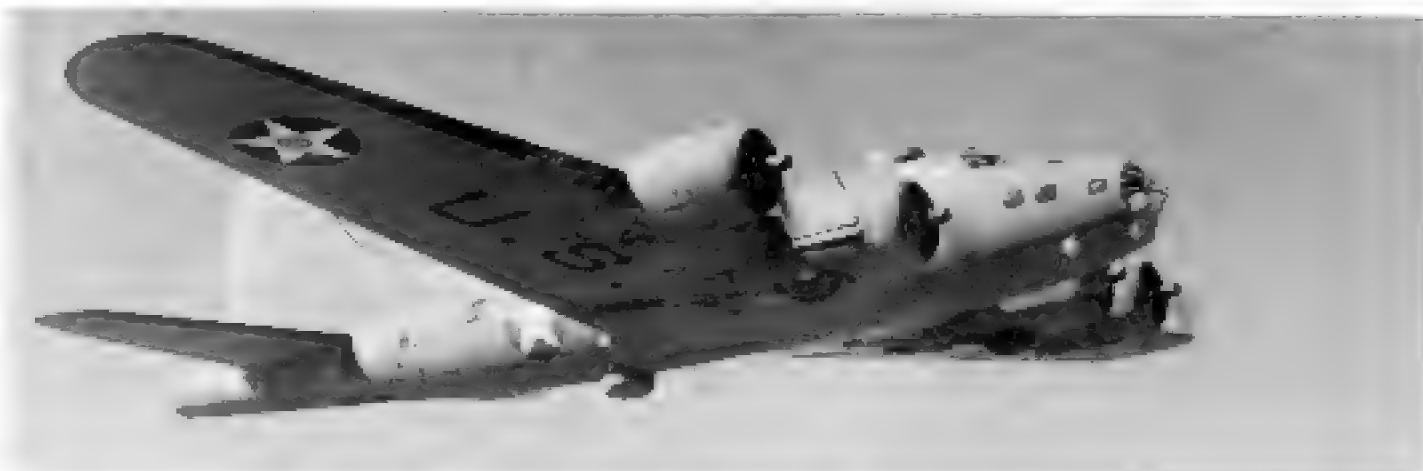
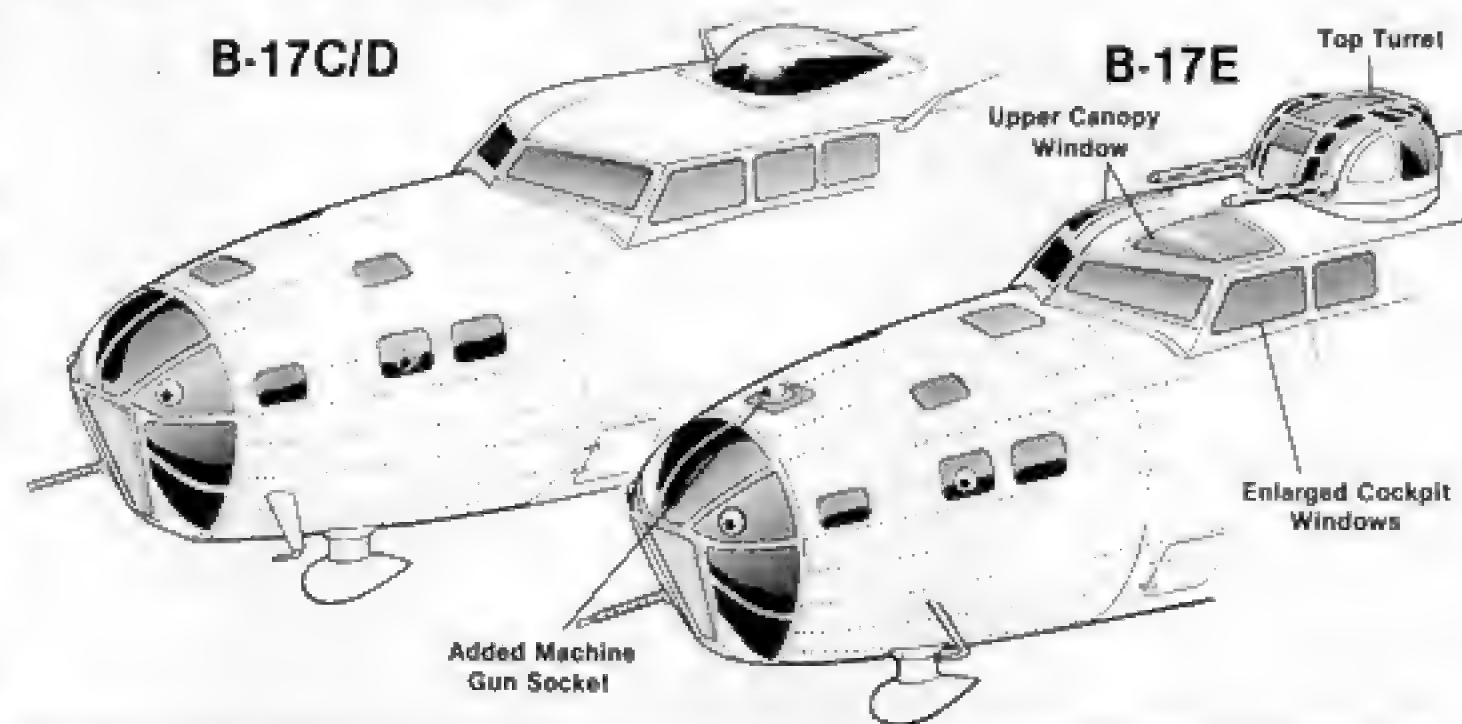
The fuselage aft of the radio compartment was widened and deepened in order to accommodate a tail gun position housing a pair of .50 caliber machine guns with the gunner sitting in a glass enclosure under the rudder. Sitting is not quite correct since the gunner was actually kneeling, with only a portion of his anatomy resting on a bicycle seat. A larger vertical tail with a long dorsal fin was added, and the span of the horizontal stabilizer was increased by 9'3". Provision was made for a pair of .50 caliber machine guns firing upward through removable panels from the radio operator's position. The teardrop shaped waist gun windows were replaced by large rectangular windows, with the single .50 caliber machine guns being mounted on posts identical to those in the earlier B-17D. On the lower fuselage just aft of the bomb bay area, a Bendix twin .50 caliber remote-control machine gun turret, which was aimed and fired by a gunner sighting through a bubble just aft of the turret, replaced the tub-like belly machine gun position of the D series. A power-driven Sperry dorsal turret housing a pair of .50 caliber machine guns, which were fired by the Flight Engineer was mounted atop the fuselage in place of the commander's sighting bubble found on earlier Forts. Both the top turret and belly turret had complete 360 degree traverse. Several ball and sockets for both .30 and .50 caliber guns were mounted in the nose cone and cheek windows. The Boeing Flying Fortress was now very formidably armed, with attacks from any direction being risky, and attacks from the rear being especially risky. Windows were added to the top of the cockpit and the cockpit side windows were enlarged. The wings, forward fuselage, engines, and landing gear were virtually the same as those found on the earlier B-17D.

Rollout of the first B-17E took place on 27 September 1941, 150 days behind schedule. Production delays had been caused by material and trained manpower shortages, a carry over from the depression days, and although Boeing received a Priority A-1 rating, they simply could not obtain much of the needed materials to build the B-17E. In late 1940, even though Boeing had a contract to build 277 B-17Es, material shortages caused them to lay off workers and shut down portions of the assembly line. By the Spring of 1941, the problems were eased by government intervention, and the B-17E went into production. The first B-17E, serial 41-2393, rolled out of the Seattle factory, taxied to the end of Boeing Field, ran up the brand new Wright Cyclone engines, and the pilot calmly took the new aircraft on her first flight. Though the first B-17E was 150 days behind schedule, the 512th machine, the final B-17E, rolled off the line 49 days ahead of schedule. Delivered cost of the B-17E was \$298,065.00.

Combat soon pointed up the deficiencies of the Bendix remote-control belly turret. Not only was sighting difficult because the gunner had to sit on his knees and sight through the belly mounted bubble, making firing awkward at best and peering through the periscopic sight caused many gunners to suffer both vertigo and extreme nausea. Beginning with the 113th B-17E, a Sperry retractable ball turret replaced the Bendix remote-control belly turret. The Sperry ball turret was hydraulically suspended from inside the aft fuselage of the aircraft and could be raised and lowered externally while in flight. The ball turret could only be entered from inside the aircraft while in flight, by rotating the guns straight down, which brought the entry door inside the aircraft. If the ball turret rotating mechanism jammed while the turret was manned, the ball turret gunner had the unenviable joy of riding all the way home in the cramped ball...and making a landing while stuck inside the jammed ball turret, with his backside only inches off the tarmac. It could



The B-17E prototype in flight over Seattle's harbor district in September of 1941. The B-17E introduced an entirely new rear fuselage, a twin .50 caliber tail gun position, and a twin-gun Bendix upper turret. (Garrett)



One of the preproduction prototypes of the B-17E, the remote control Bendix belly turret and sighting blister can be seen immediately aft of the bomb bay, these were features introduced on the B-17E. The paint scheme is Olive Drab and Neutral Gray, with 'US Army' in Black on the underside of the wings. (AFM)

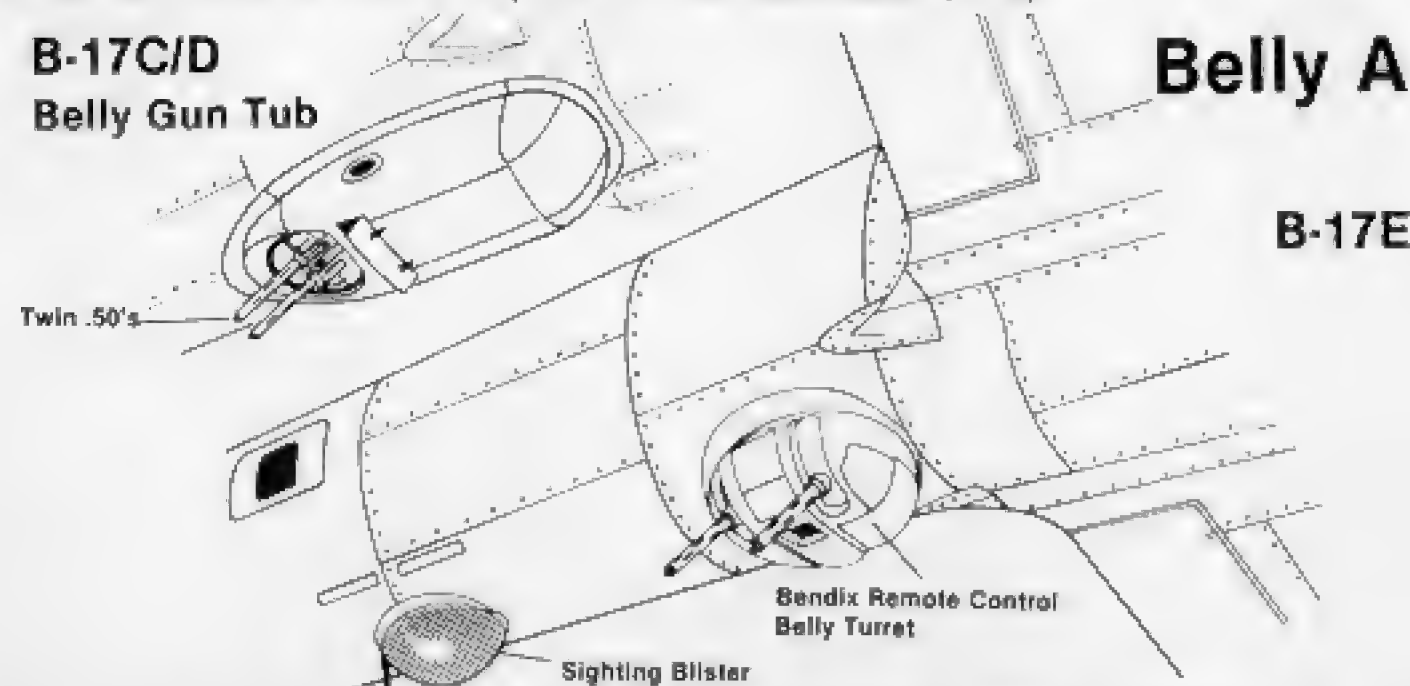


The first wartime photo of the Boeing B-17E assembly line was released in January of 1942. Boeing built 512 B-17Es between September 1941 and May 1942, more than three times the combined total of all previous Fortress models. (AFM)



"TYPHOON McGOON II", B-17E serial 41-9211, of the 98th BSq, 11th BGP, was equipped with ASV (Air-to-Surface-Vessel) radar with antennas under each wing and protruding from the upper nose. January 1943, New Caledonia. (AFM)

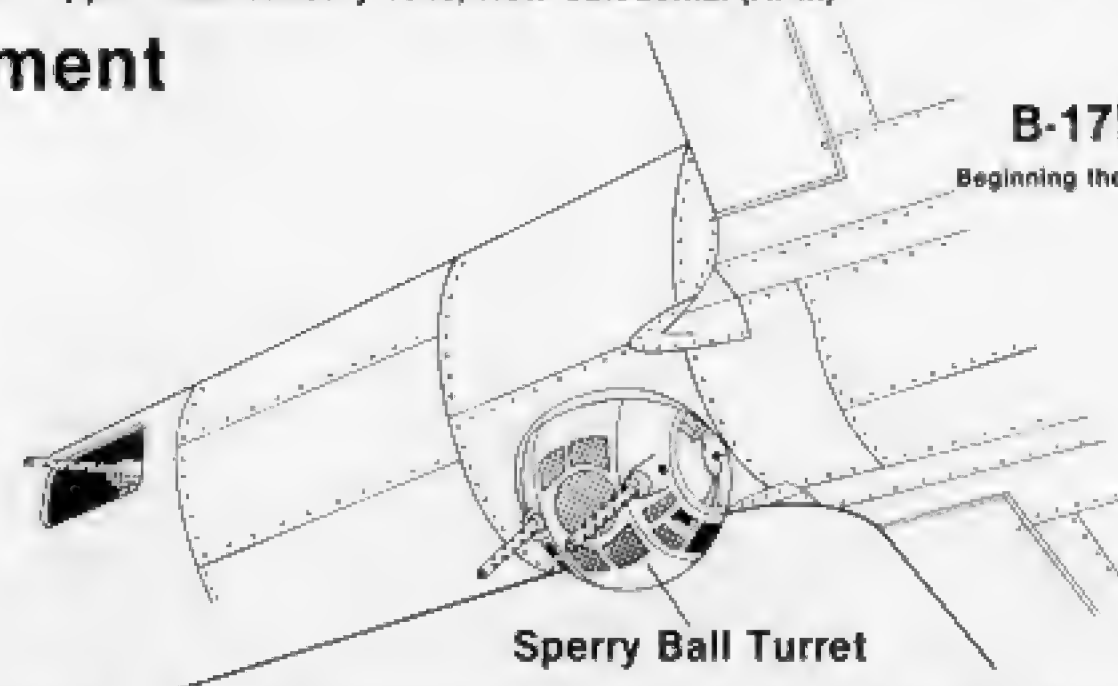
B-17C/D Belly Gun Tub



Belly Armament

B-17E

Beginning the 113th Production Aircraft



be an exhilarating experience, and one that could get down right thrilling when the Fort was shot up and there was the possibility of a crash landing on reaching home.

The B-17E was quickly phased into operational Army Air Force inventory during the Fall of 1941.* B-17Es saw combat from the moment the United States entered the war. A few of the new E models were among those that the Japanese mauled on the ground at Pearl Harbor. B-17Es were the backbone of the American airpower fighting the delaying action in the Pacific throughout 1942. They were involved in both the Coral Sea and Midway bat-

*The Army Corps changed its name to Army Air Force on 20 June 1941.

ties, and although they had been originally designed for high altitude bombing of enemy shipping, it was found that hitting a twisting, turning, high speed vessel was almost an impossibility. The Army Air Force began to use the B-17E as a high level strategic bomber against land targets. It was in this role that the B-17 would excel. On 17 August 1942, twelve 97th BGP B-17Es left their English base and dropped the first bombs by an American unit on Hitler's Festung Europa. The target was Rouen-Sotheville marshalling yards. All aircraft returned to base. It was a very successful beginning to the American daylight precision bombing campaign which would help to break the back of the 1000 Year Reich. But some very hard years were ahead.

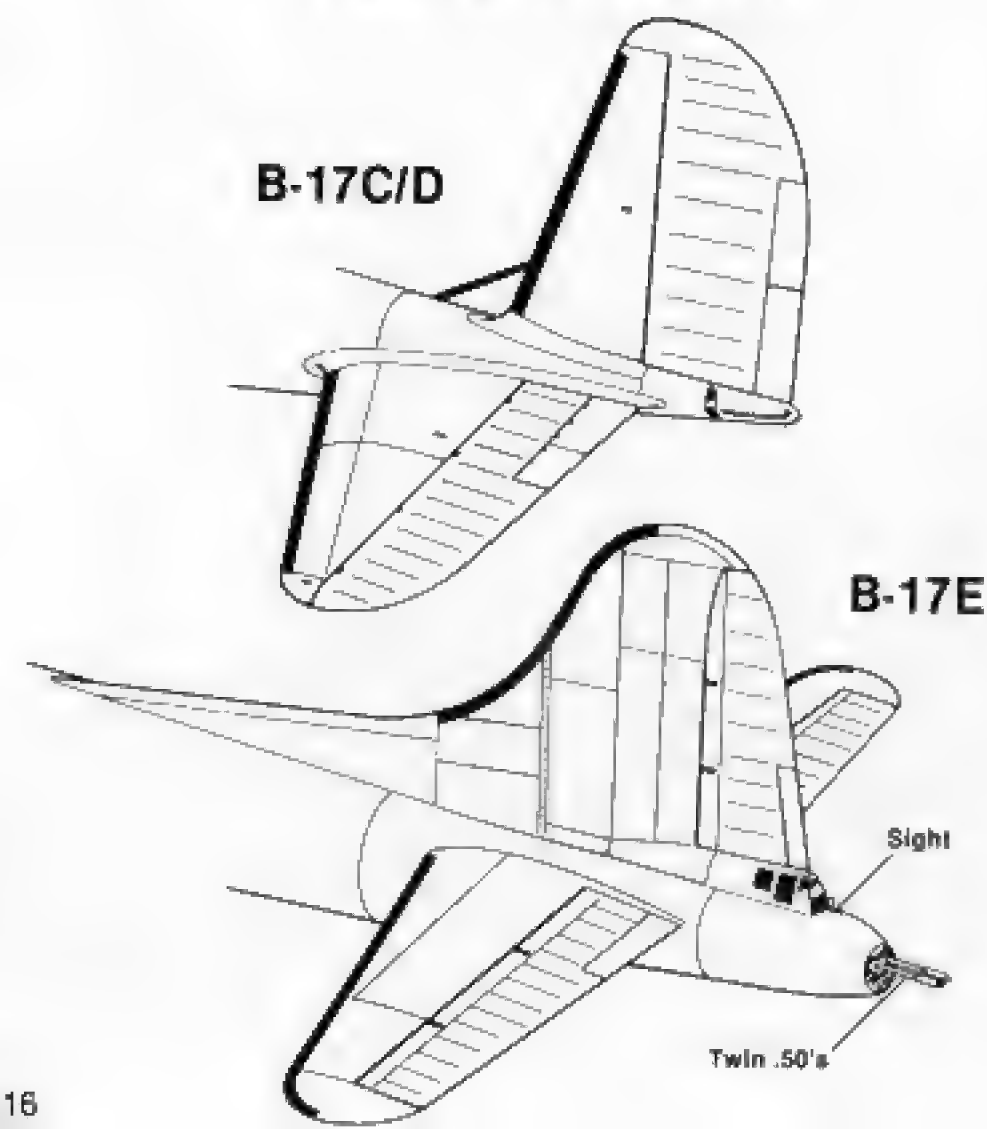


An echelon left of B-17Es belonging to a training unit in the US. Note the Medium Green camouflage blotches which were an add option to the standard Army OD paint scheme. (AFM)

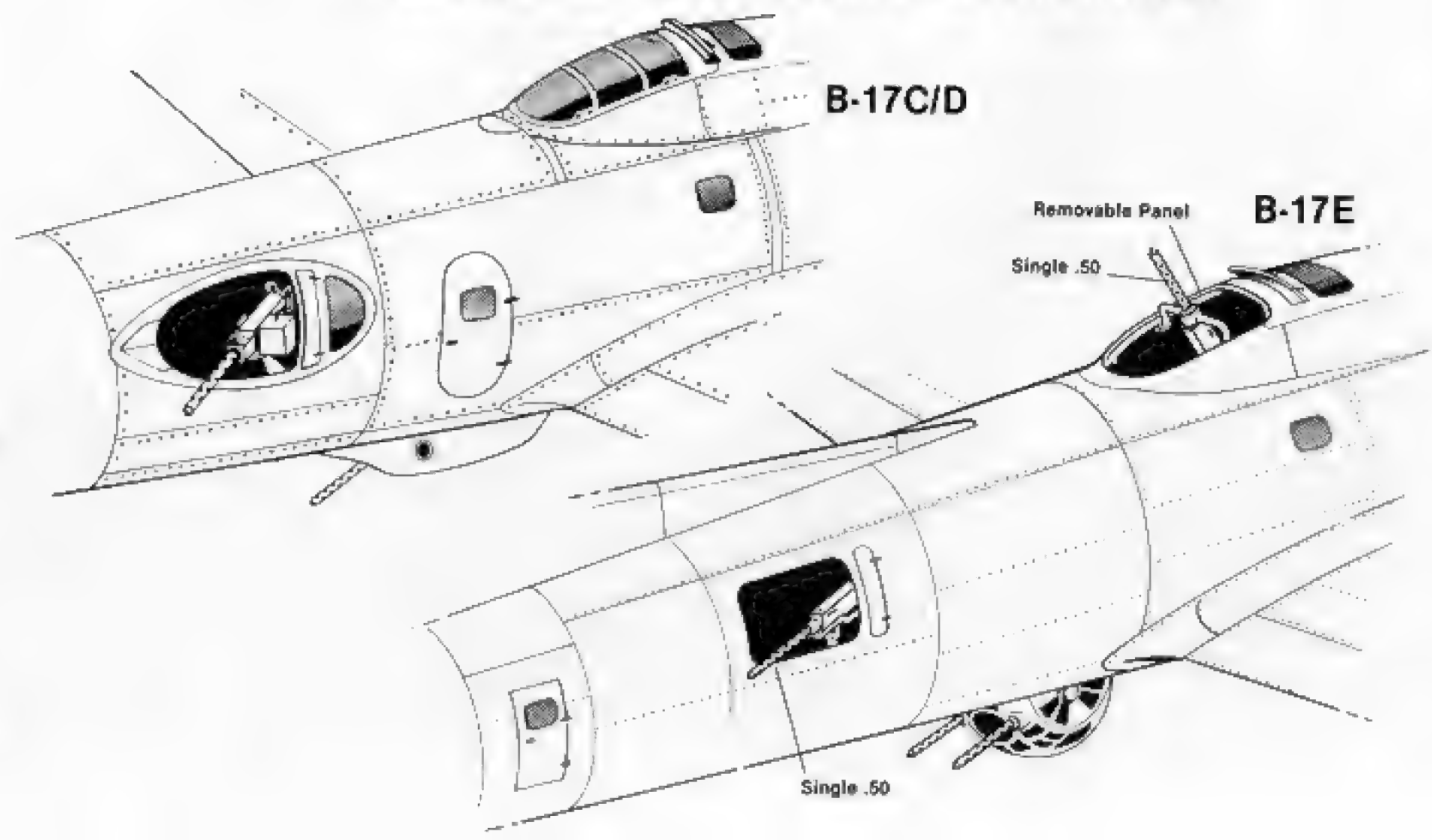


"HONIKUU OKOLE", a B-17E from the 43rd BGP at Port Moresby, illustrates the attitude of the American bomber crew toward the Japanese (note the hand at the end of the name). Pacific-based B-17Es carried many different nose armament modifications, none of which were standardized. (AFM)

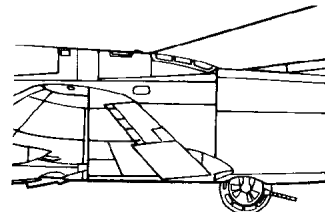
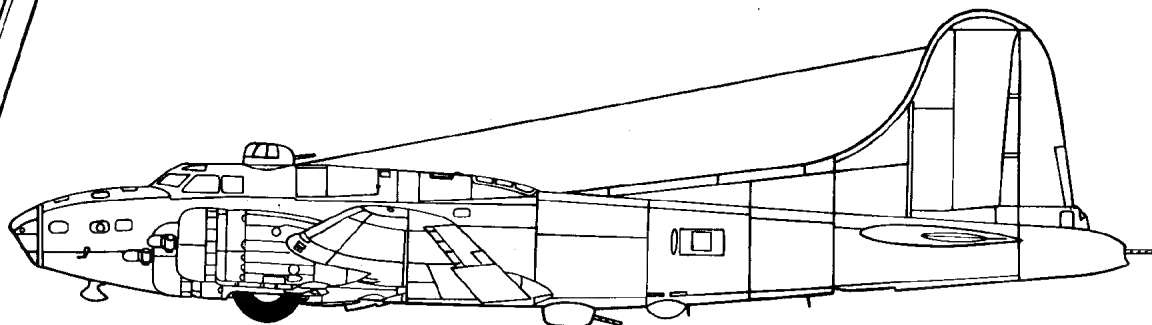
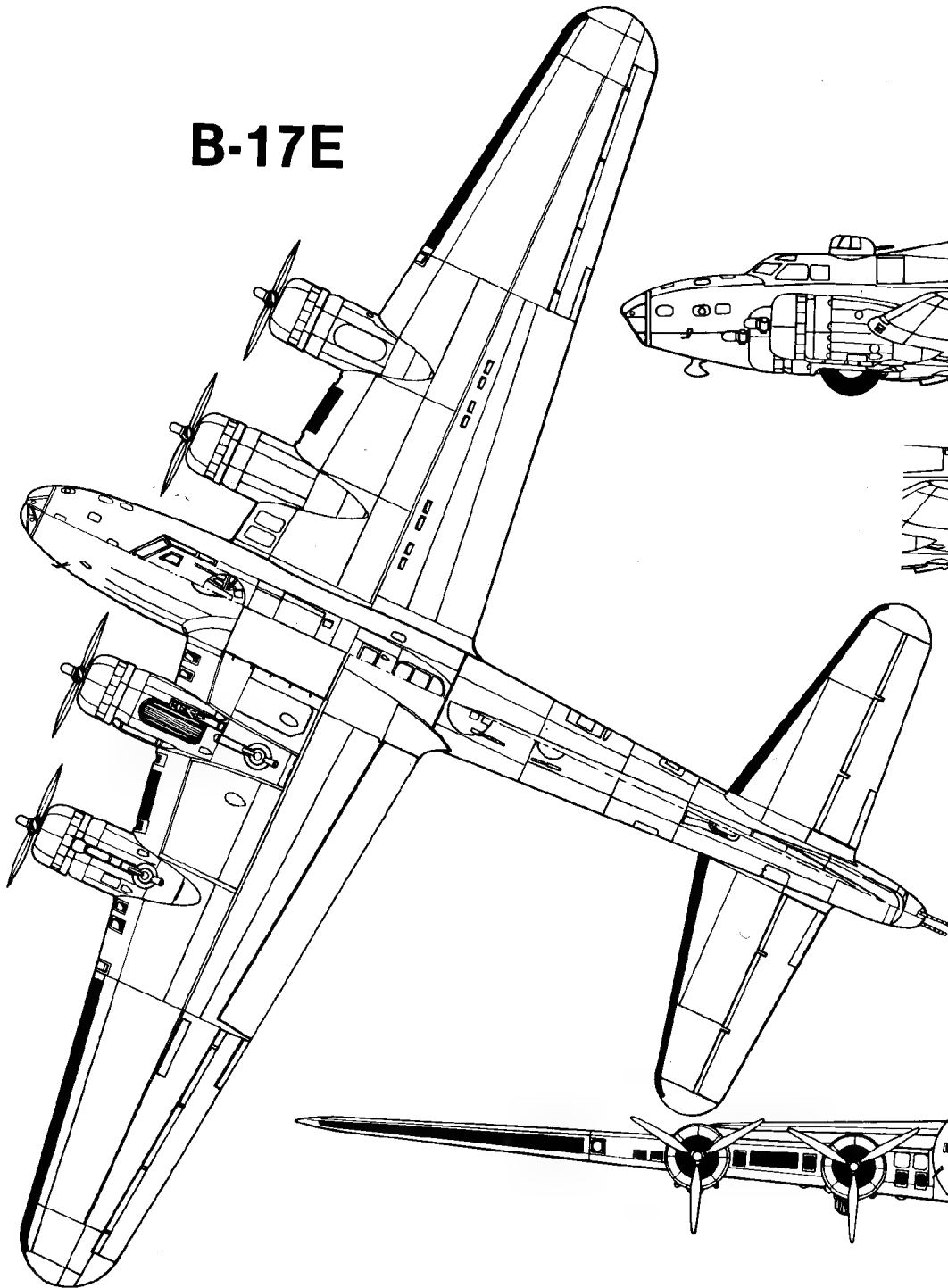
Tail Armament



Navigator and Waist Armament



B-17E

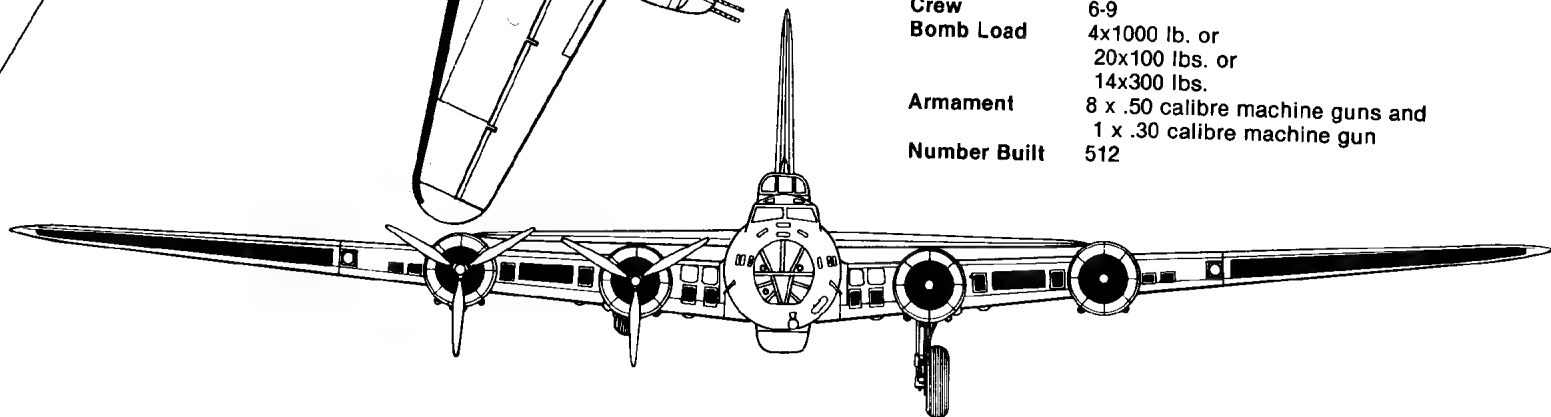


Sperry Ball Turret

Specifications

B-17E

Wing Span	103 ft. 9 3/8 in.
Length	73 ft. 9 3/4 in.
Height	19 ft. 2.44 in.
Powerplant	Wright R-1820-65 Cyclone with 1000 hp @ 2300 rpm @ 25000 ft.
Empty Weight	32,251
Gross Weight	40,260 lbs.
Cruising Speed	226 mph
Top Speed	318 mph
Ceiling	36,000 ft.
Range	3300 mile
Crew	6-9
Bomb Load	4x1000 lb. or 20x100 lbs. or 14x300 lbs.
Armament	8 x .50 calibre machine guns and 1 x .30 calibre machine gun
Number Built	512

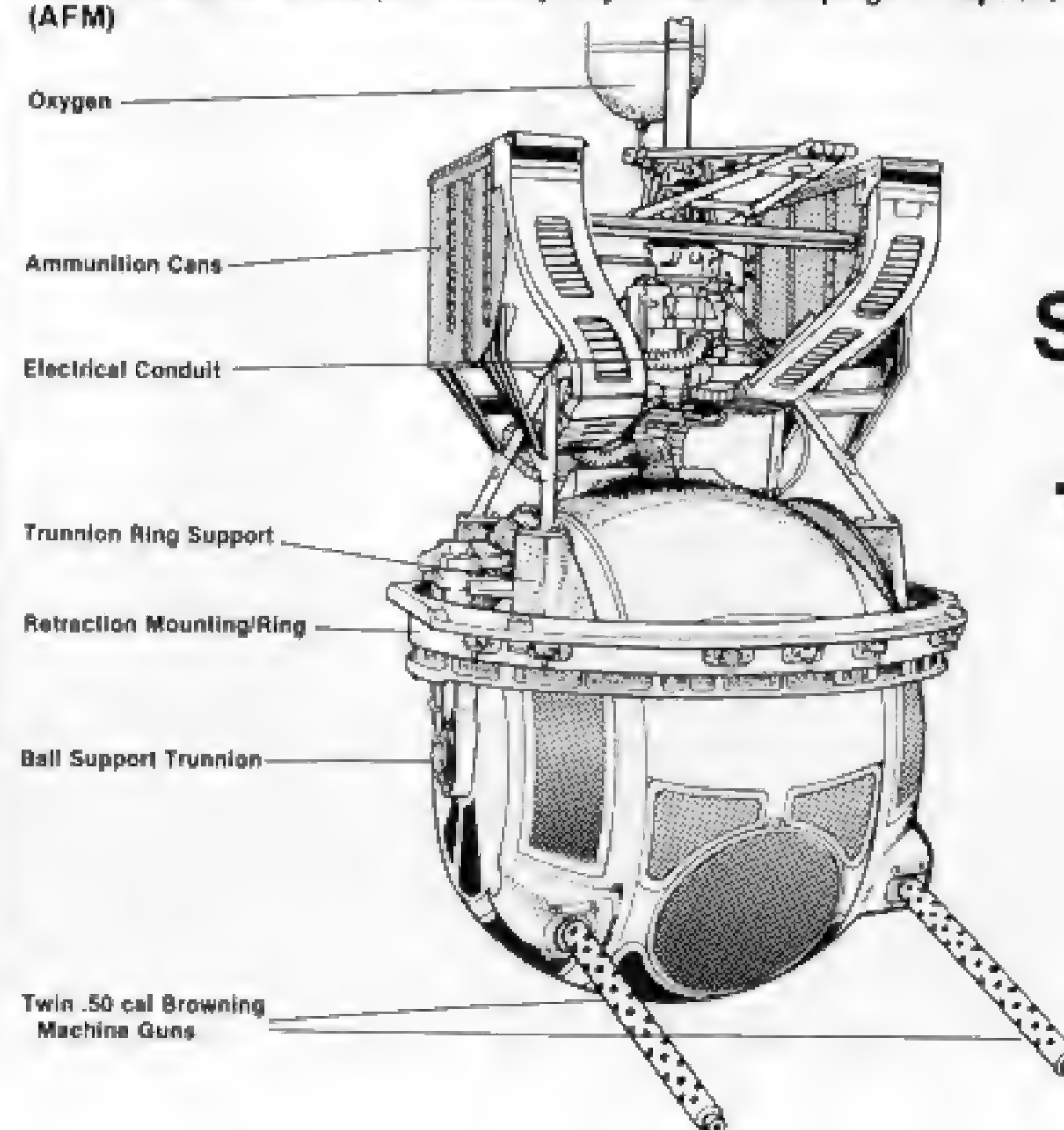




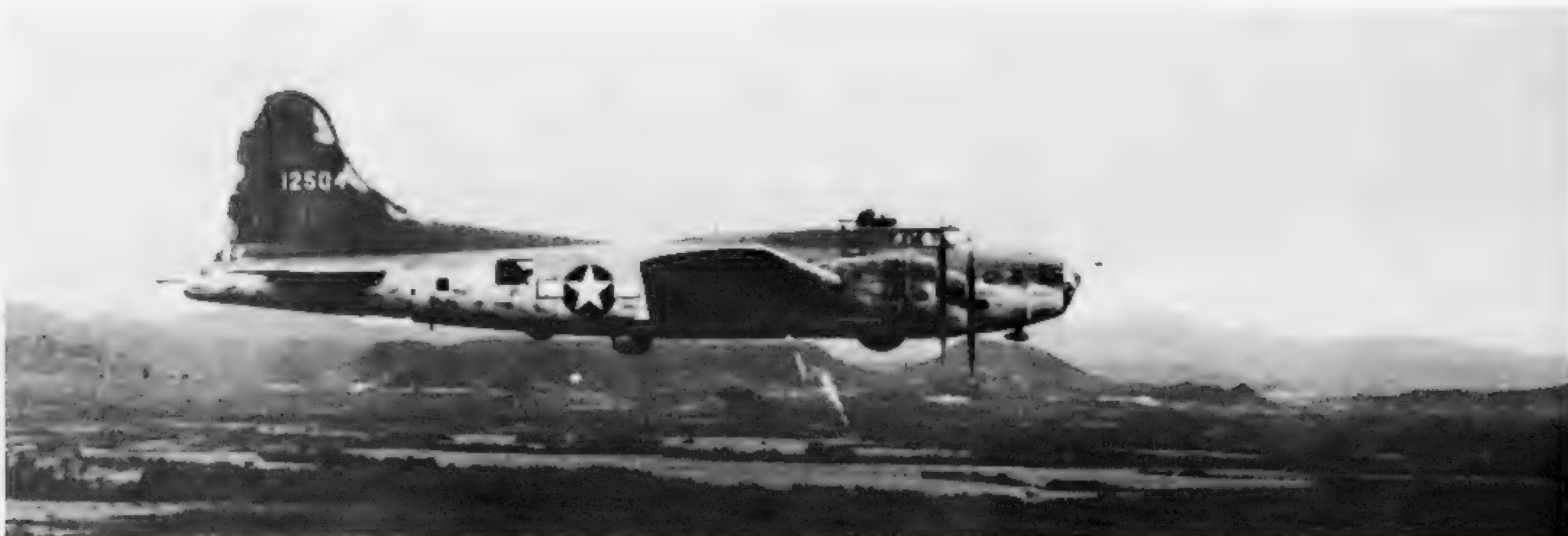
A pair of 97th BGp B-17Es in the Summer of 1942. The near aircraft still has the Dark Earth, Dark Green, Pale Blue camouflage of RAF aircraft. The US Army Air Force re-acquired several B-17Es built for the RAF. (Garrett)



The "SUZY-Q" flew all the way around the world to fly and fight with the 19th BGp in the South Pacific. She took part in every major Pacific campaign except the Battle of Midway. (AFM)

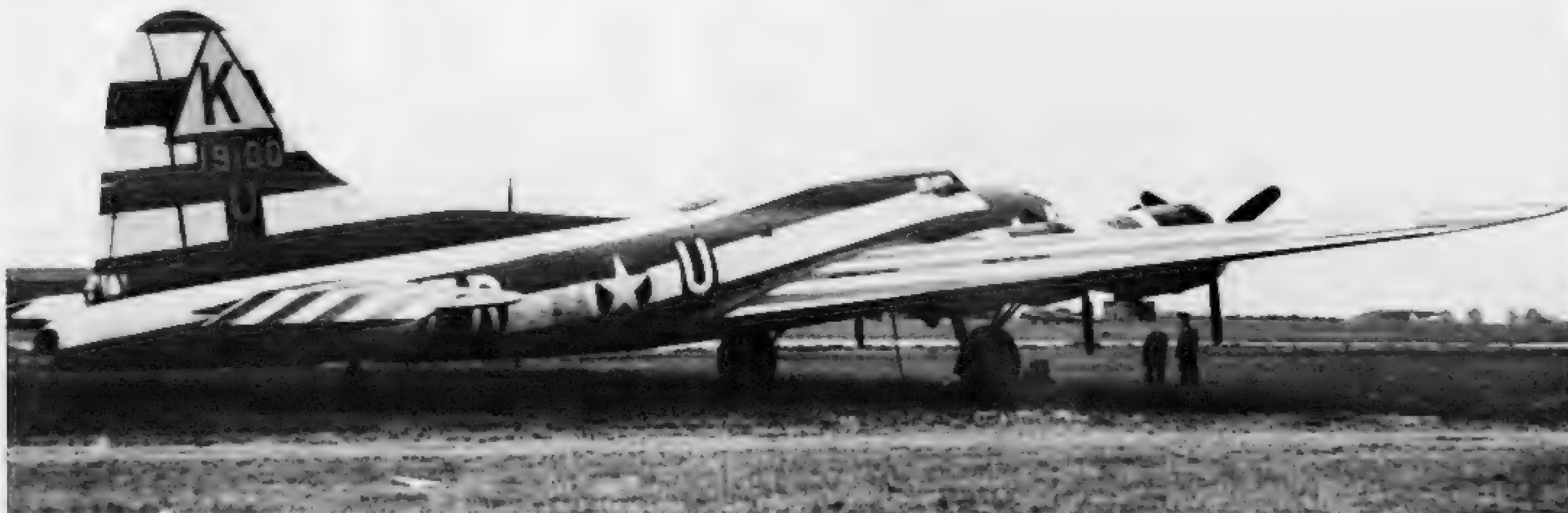


Sperry Ball Turret



(Above) An unusual camouflaged B-17E based near the Panama Canal. The aircraft appears to be Oyster White under surfaces with Olive Drab blotches on the sides and Olive Drab upper surfaces, which would be in keeping with other AAF anti-submarine camouflage schemes of this time period. (AFM)

"BIRMINGHAM BLITZKRIEG", a B-17E serial 41-9100, became the formation aircraft of the 379th BGp after the unit was re-equipped with B-17F aircraft. Red and White stripes have been painted over the entire aircraft so as to maximize its visibility to the other crews which formed up on her for the trip to Nazi occupied Europe. (AFM)



B-17F

The B-17F would be the first Fortress to go into "wartime mass production". Not that 512 B-17Es had not been mass production, but the 512 Es seems to pale in comparison with the 3,405 B-17Fs that were built. Army Air Force contracted for so many F models that Boeing could not keep up and had to subcontract to both Lockheed and Douglas to license build them. Boeing built 2300 B-17Fs, while Lockheed built 500 in their Vega facility at Burbank, and Douglas built 605 at their Long Beach plant. It was only fitting that Douglas, who had won the original bomber competition over the Boeing Model 299, would now be building the big Boeing bomber under license. This manufacturing triumvirate was known as the B.V.D. pool.

To create the B-17F, over 400 changes were made in the Flying Fortress. By far, the majority of these were internal and detail changes such as added armor, instrumentation, etc. The two biggest external changes were in the nose cone and the propellers. The multi-paneled nose cone was replaced by a frameless, one-piece bubble transparency that was decidedly more pointed than the E model. The propeller blades were widened through their chord giving them the so-called 'paddle blade' effect for a greater bite of the airstream. The wider blades also caused the leading edge of the engine cowlings to be reshaped and shortened so the wider paddle blades could clear the cowlings when they were feathered. The F model was also the first variant to carry fuel tanks in the outer wing panels, commonly called "Tokyo Tanks". The B-17F had the highest performance statistics of all the B-17 models. With "Tokyo Tanks", range was increased to 4220 miles, and although heavier than previous models, the B-17F was the fastest with a 325 mph top speed. The speed increase was a result of the new 'paddle bladed' props and the latest model Wright Cyclone engines, the R-1820-97, rated at 1380 horsepower in war emergency setting. Maximum bomb load was 9600 lbs, but the normal combat load in Europe was about 4000 lbs, which could be carried internally in the bomb bay, externally on underwing racks between the inboard engine nacelles and the fuselage, or a combination of the two.

Nose armament on the F was modified throughout the production run by Boeing and Army at field modification centers. An astrocompass bubble was added to the nose just in front of windscreen. Problems with the side nose gunners getting into each other's way was alleviated by enlarging and staggering the side nose gun windows. Single and twin .50 caliber machine guns were mounted on tube frames to fire through the center of the enlarged nose cone. Army modification centers bulged the side windows outward to allow the gunners a greater forward firing angle. These bulged 'cheek' guns were standardized by Boeing beginning with the block-55 aircraft. Beginning with block-75 Douglas-built B-17Fs, a Bendix chin turret was mounted just under the bombardiers seat in the nose. Gun direction and firing were controlled through a firing yoke mounted in the right side of the forward nose. The chin turret, installed on the last 86 Fs, would be standard on all B-17s from this point on. The cost of the B-17F varied greatly from batch to batch, and company to company, but averaged out to \$357,655.00 per aircraft.

Operations in the B-17F began as soon as the first aircraft became available. Army rushed the B-17F to England and Africa as replacements for their war-weary B-17Es as quickly as possible. Great Britain received 19 Fortress IIs (B-17Fs) beginning in August of 1942. Most of these aircraft were operated by RAF Coastal Command on anti-submarine patrol duty. Many US Army Air Force B-17Fs served with the 8th Air Force in England, flying well over 100 missions. The normal tour for a crew was 25 missions and then the crews were rotated home. But the aircraft continued to fly until they were either shot down or simply couldn't fly anymore. A few aircraft were rotated back to the United States with their crews to participate in War Bond rallies and good will tours. One such aircraft was "Memphis Belle", the first B-17 and crew to complete their 25 missions in Europe. After all the tours, the 'Belle' was placed in a park in Memphis, Tennessee, where she awaits restoration today, as a memorial to those B-17s and crews that did not come home.



One of the first Douglas-built B-17Fs shows off the new unframed nose perspex. The B-17F was the first model built by the Boeing/Vega/Douglas manufacturing triumvirate. (AFM)

"A-Dorable", a B-17F from the 306th BGP on its hardstand at Thurleigh, England. Note the fresh Blue surround to the fuselage national insignia covering the old Yellow surround which was applied during Operation Torch. Quite a few England-based aircraft carried the Yellow surround even though they took no part in Operation Torch. December 1942. (Army via AFM)

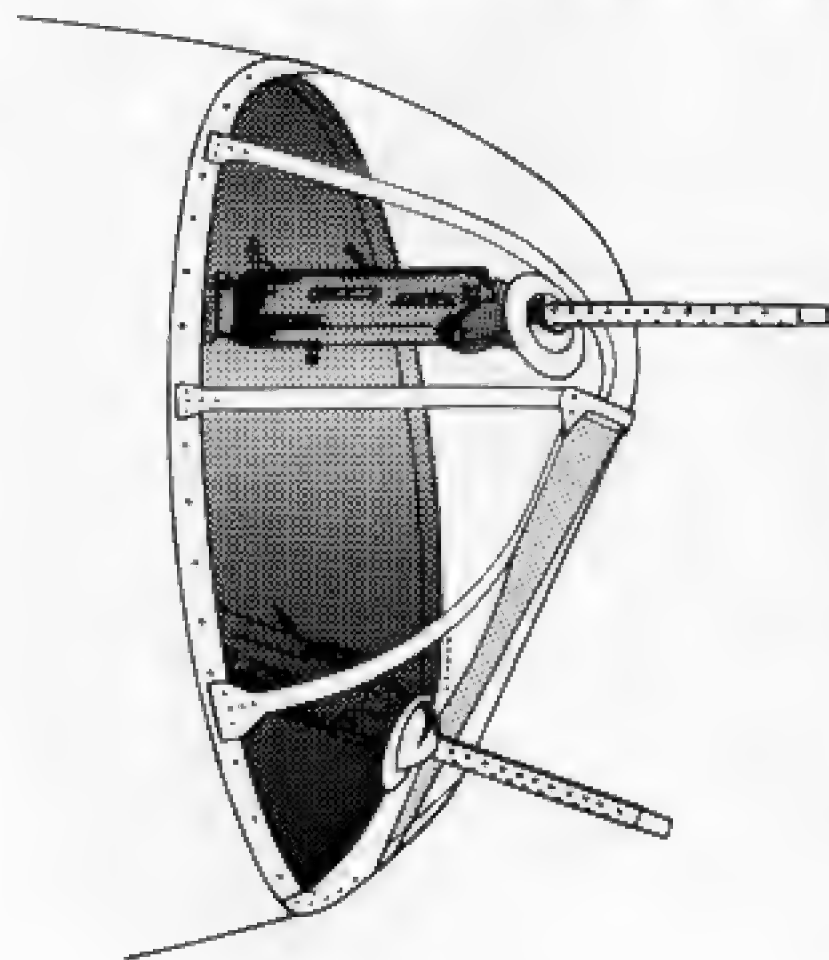




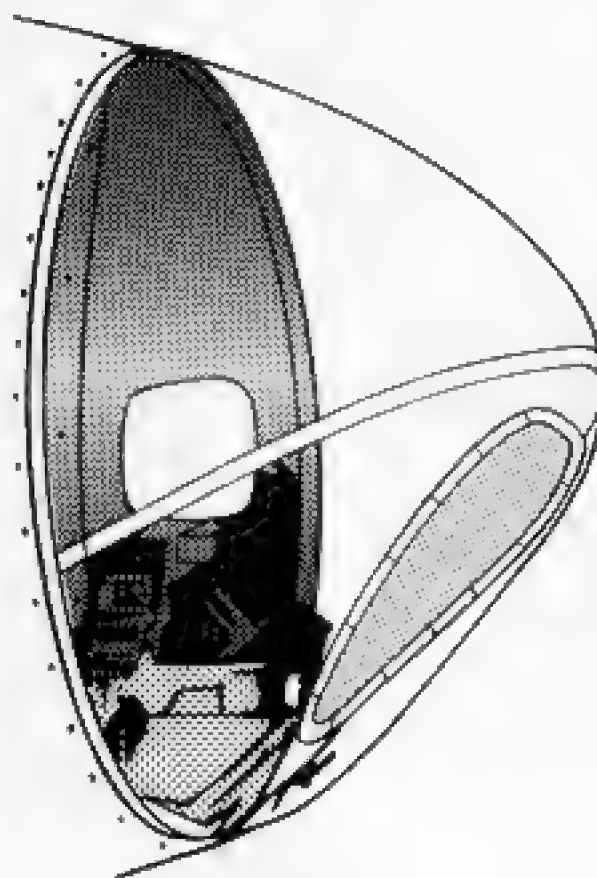
Nose Cone Development

(Above) A trio of 91st BGp B-17Fs enroute to a target in Germany during March of 1943. The Medium Green blotches are confined to the outside upper edges of the flying surfaces including the vertical fin. There was no general pattern to this blotching, and it was completely up to the local commander as to whether or not it was applied at all. (AFM)

"FAST WORKER II", a B-17F from the 359th BSq, 303 BGp, has been heavily blotched in Medium Green. All codes and serial number are in Yellow, while the name is White. (AFM)



B-17E



B-17F





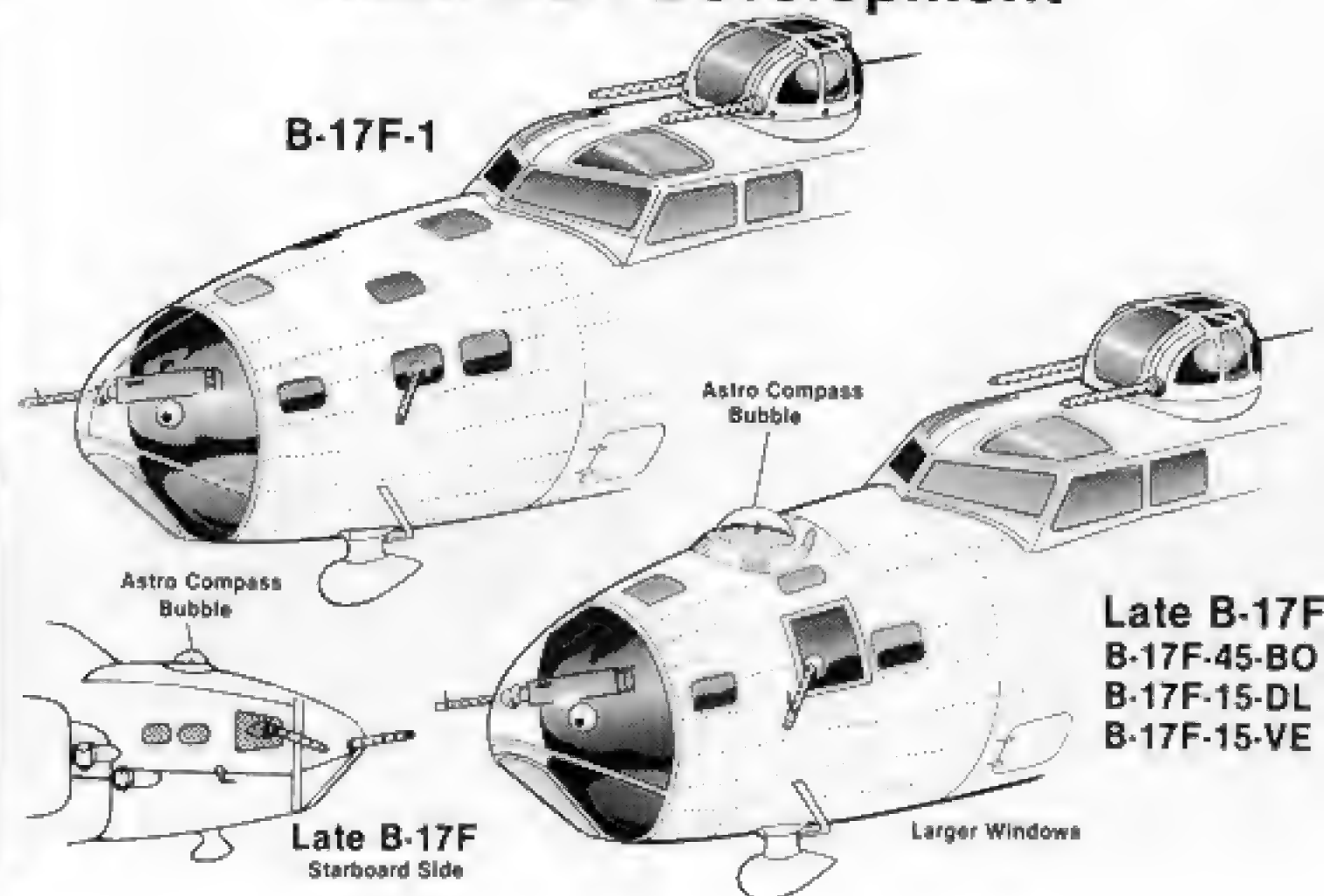
"KIPLING'S ERROR III" from the 96th BGp. Note that the de-icer boots have been removed from the wing and vertical fin. Combat crews often did this since flak shredded the boots which created added drag during the long trip home. (AFM)

(Below) "MIAMI Clipper", a B-17F serial 42-29815, from the 91st BGp, has the later, much larger cheek gun windows and gun mounts. The 'Clipper' also carries a .50 caliber gun on a flexible mount in the upper nose glazing. (AFM)



"LUCKY STRIKE", a 381st BGp B-17F at Ridgewell, England. The reinforced gun mount can be seen at the top of the nose glazing. (AFM)

Nose Gun Development





"THIS IS IT", a B-17F-10-VE, about to unload her bombs over Mainz, on 30 December 1943. At this point in the bomb run, the bomber is locked on course by the Norden bombsight, which will automatically release the bombs at exactly the correct point to bring them down on the target. (AFM)

WOLF HOUND a late model B-17F with the large nose gun window was lost on a December 1942 raid on the Rouen Marshalling yards. Brought down nearly intact, it was repaired and used to familiarize Luftwaffe fighter pilots with the strengths and weaknesses of their quarry. (Ken Merrick)

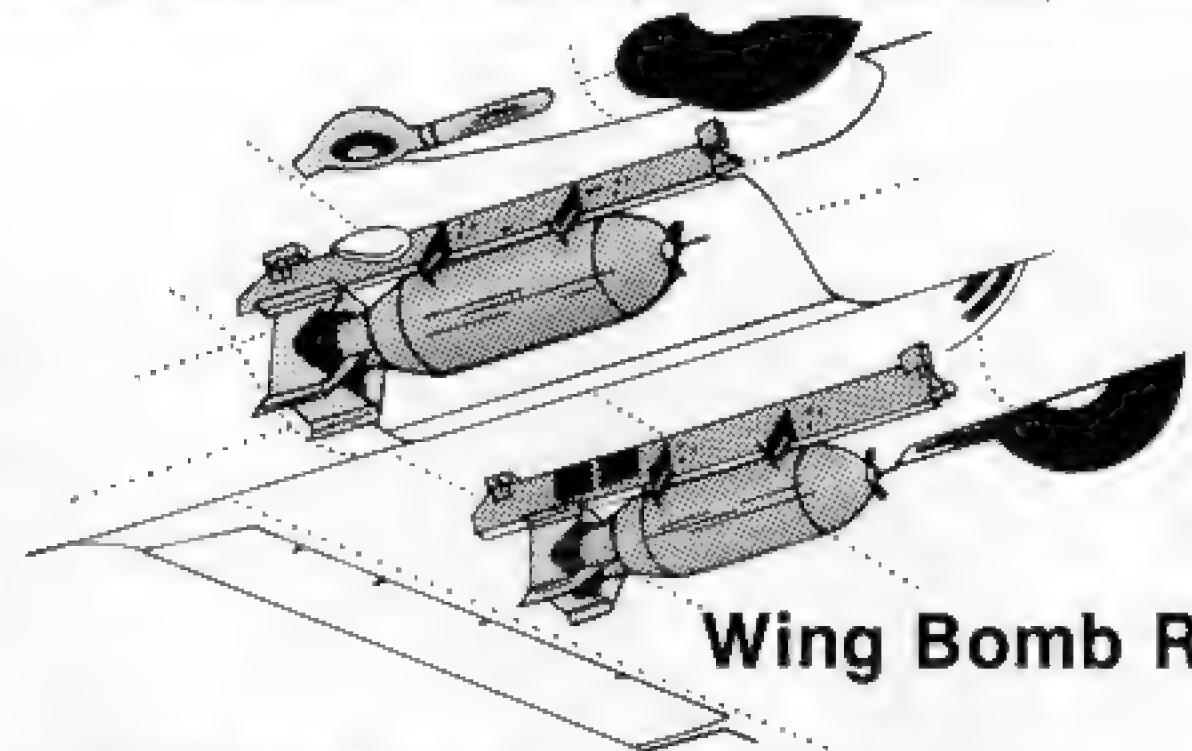


(Below) The famous **"MEMPHIS BELLE"** and her crew arrive back in the US after becoming the first B-17 crew to complete twenty-five missions over Nazi occupied Europe. (Olmsted)





(Left) Beginning with Boeing Model -30, and both Vega and Douglas built -20s, B-17Fs had underwing racks for external carriage of up to 1000 lb bombs. (AFM)



Wing Bomb Racks

A B-17 formation seen from the cockpit of a Luftwaffe fighter closing for a stern attack. Fire from forty-eight .50 caliber machine guns will soon be reaching out.





The 95th BGp on its way to Germany. Contrails marked the path of the American bombing offensive almost every day for three years. (AFM)



The tail stinger of the B-17. Note the flash hiders on the gun muzzles, the ring and bead gunsight, and the formation lights below the guns. (USAF via Ethell)

(Left) "All-American", a 97th BGp B-17F-5-BO, was almost cut in half when a Bf-109, with a dead pilot, rammed the aircraft over Tunisia on 1 February 1943. The pilot, Lt. Kenneth Bragg, immediately switched to autopilot and began the one and one-half hour flight to the nearest Allied airbase. The autopilot electronically compensated for all the missing controls and brought the aircraft safely home. The tail gunner, S/Sgt Sam Sarpolus, manned the tail guns throughout the trip watching for enemy fighters. (AFM)



"MISS OUACHITA", B-17F serial 42-3040, from the 91st BGp, is being thoroughly checked out following a mission during the early Fall of 1943. "MISS OUACHITA" would not return to Bassingbourne from a mission on 22 February 1944. (USAF via Ethell)

(Left) Heinz Bar visits MISS OUACHITA, one of the twenty-one four engine bombers he was credited with destroying. Bar survived the war with 220 victories, only to be killed in a light plane crash in 1957.

MISS OUACHITA seems to have suffered extensive damage to the tail assembly, which would indicate a stern attack by Bar. As Flying Fortress raids increased the Luftwaffe found the a frontal attack with its high closing speed was the most effective method of attacking the B-17.



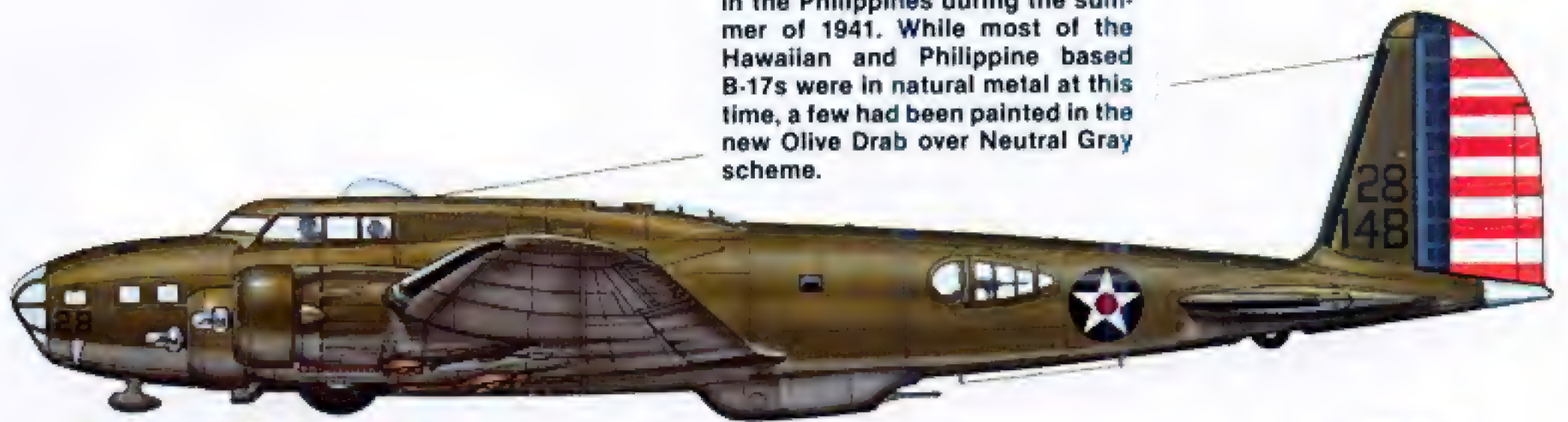


More trouble for Hitler's Reich. The 534th BSq awaits the signal to start engines for another long mission, usually eight to ten hours in length, deep into Nazi Germany. The 534th BSq was part of the 381st BGp, tail code 'triangle L', and was based at 8th Air Force Station 167, Ridgewell, England. 12 January 1944. (USAF via Ethell)

"Sad Sack", B-17F serial 41-24504, from the 324th BSq, 91st BGp on the Basingbourne ramp in March, 1944. "Sad Sack", coded DP ★ D, flew the rough 'Big Week' missions in February, 1944, which crippled the Luftwaffe for the rest of the war. Her nose scoreboard read fifty missions and fourteen German fighter kills before she was sent home to begin a long War Bond selling tour. (USAF via Ethell)



B-17C of the 14th BSq, 19th BGp, in the Philippines during the summer of 1941. While most of the Hawaiian and Philippine based B-17s were in natural metal at this time, a few had been painted in the new Olive Drab over Neutral Gray scheme.



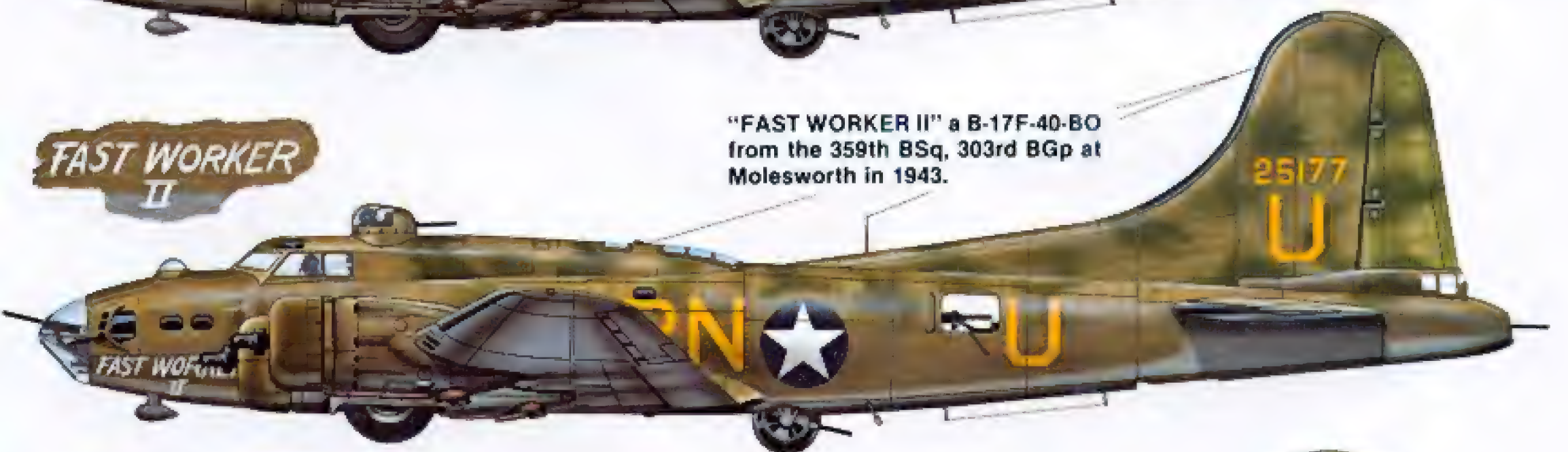
"The MUSTANG", a 43rd BGp B-17F-25-BO operating out of Port Moresby, New Guinea during the Spring of 1943.



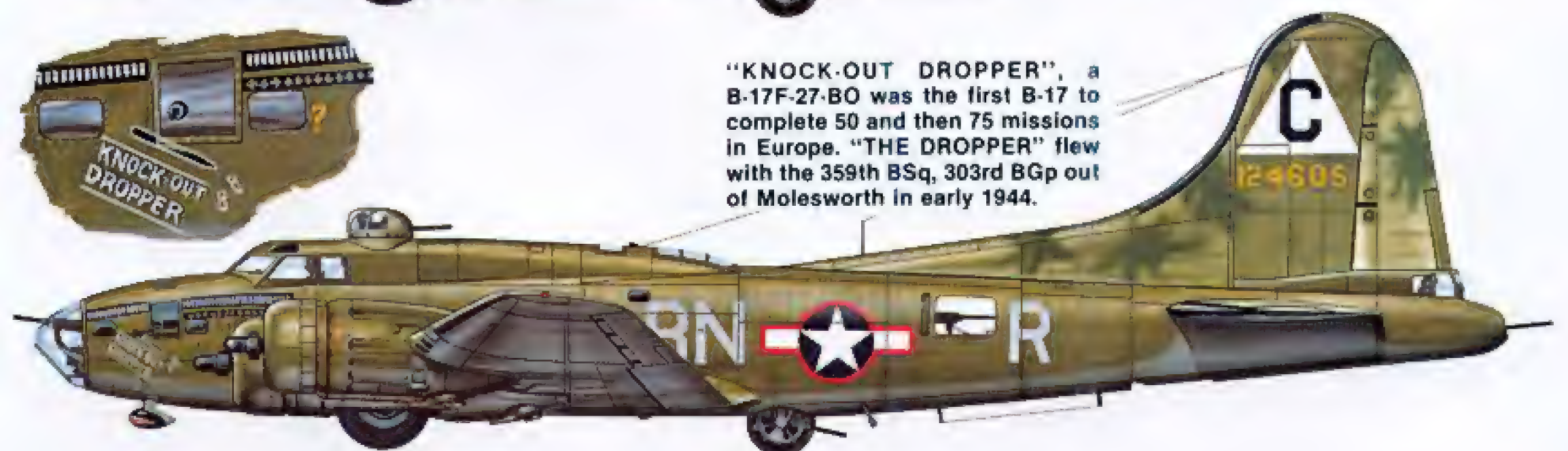
"Miss Barbara", a B-17F-20-BO of the 305th BGp at Grafton-Underwood in 1943.



"FAST WORKER II" a B-17F-40-BO from the 359th BSq, 303rd BGp at Molesworth in 1943.

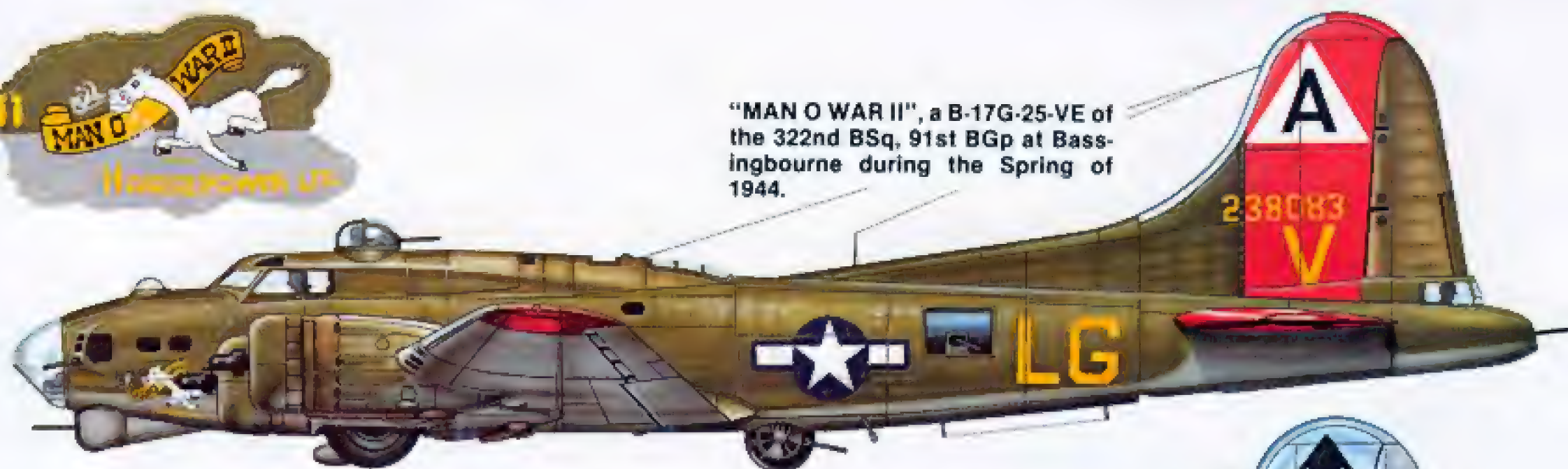


"KNOCK-OUT DROPPER", a B-17F-27-BO was the first B-17 to complete 50 and then 75 missions in Europe. "THE DROPPER" flew with the 359th BSq, 303rd BGp out of Molesworth in early 1944.



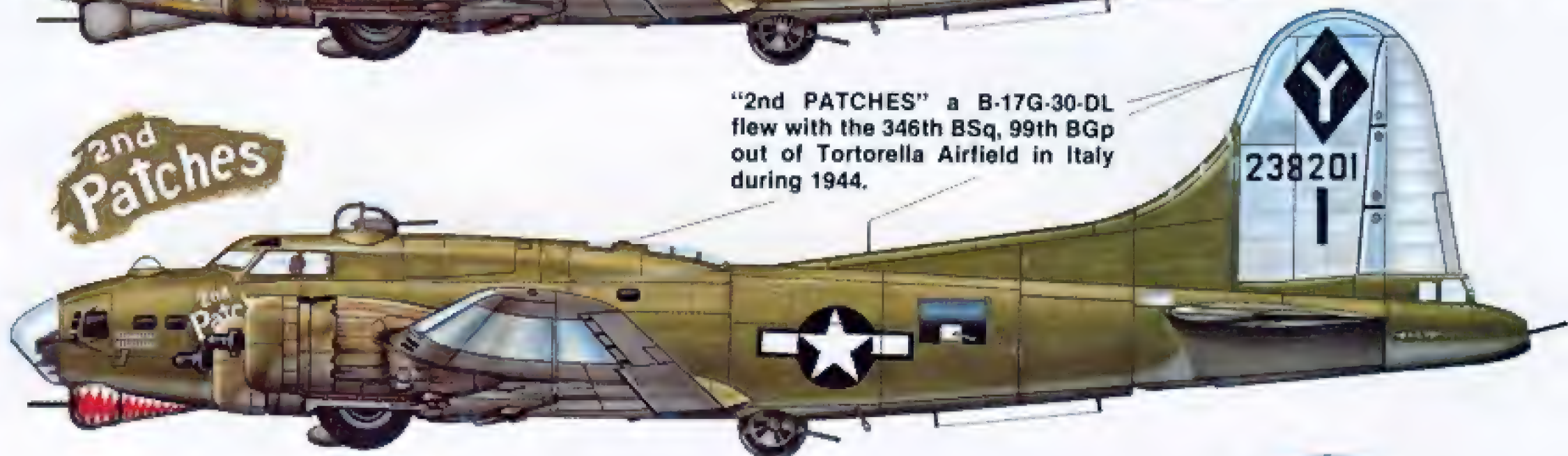


"MAN O WAR II", a B-17G-25-VE of the 322nd BSq, 91st BGp at Bassingbourne during the Spring of 1944.

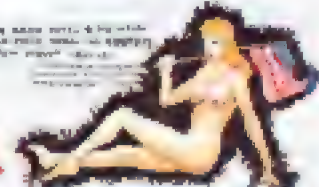


2nd Patches

"2nd PATCHES" a B-17G-30-DL flew with the 346th BSq, 99th BGp out of Tortorella Airfield in Italy during 1944.



DUCHESS' DAUGHTER

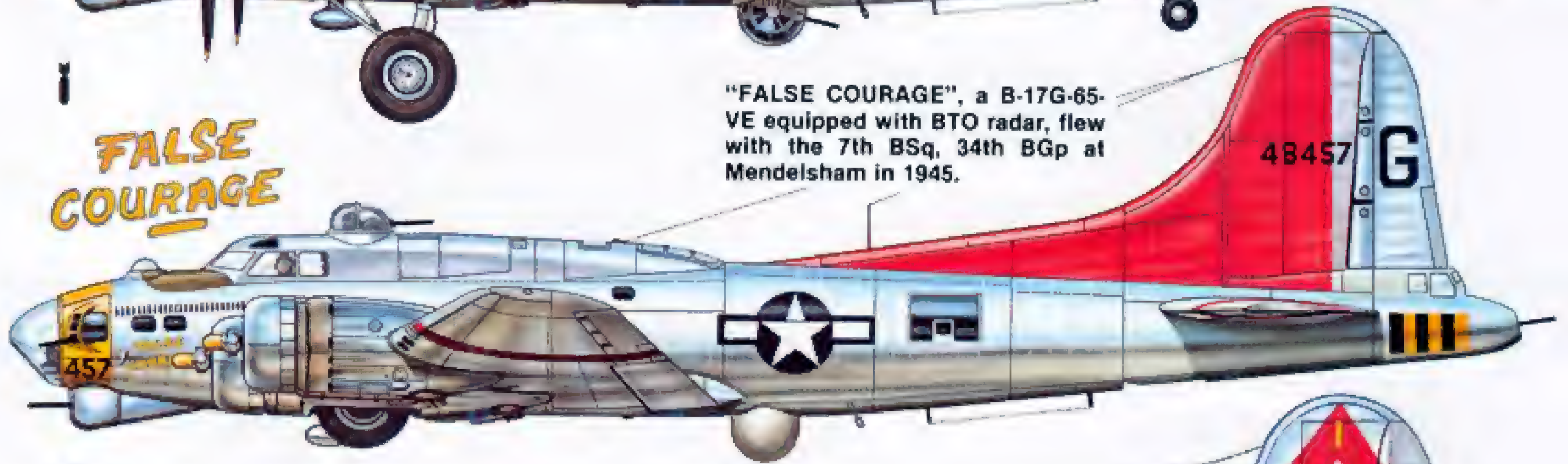


"DUCHESS' DAUGHTER", a B-17G-45-BO of the 359th BSq, 303rd BGp at Molesworth, Summer 1944



FALSE COURAGE

"FALSE COURAGE", a B-17G-65-VE equipped with BTO radar, flew with the 7th BSq, 34th BGp at Mendelsham in 1945.



"PRINCESS PAT"

"PRINCESS PAT", a B-17G-50-BO from the 358th BSq, 303rd BGp at Molesworth, Summer 1944



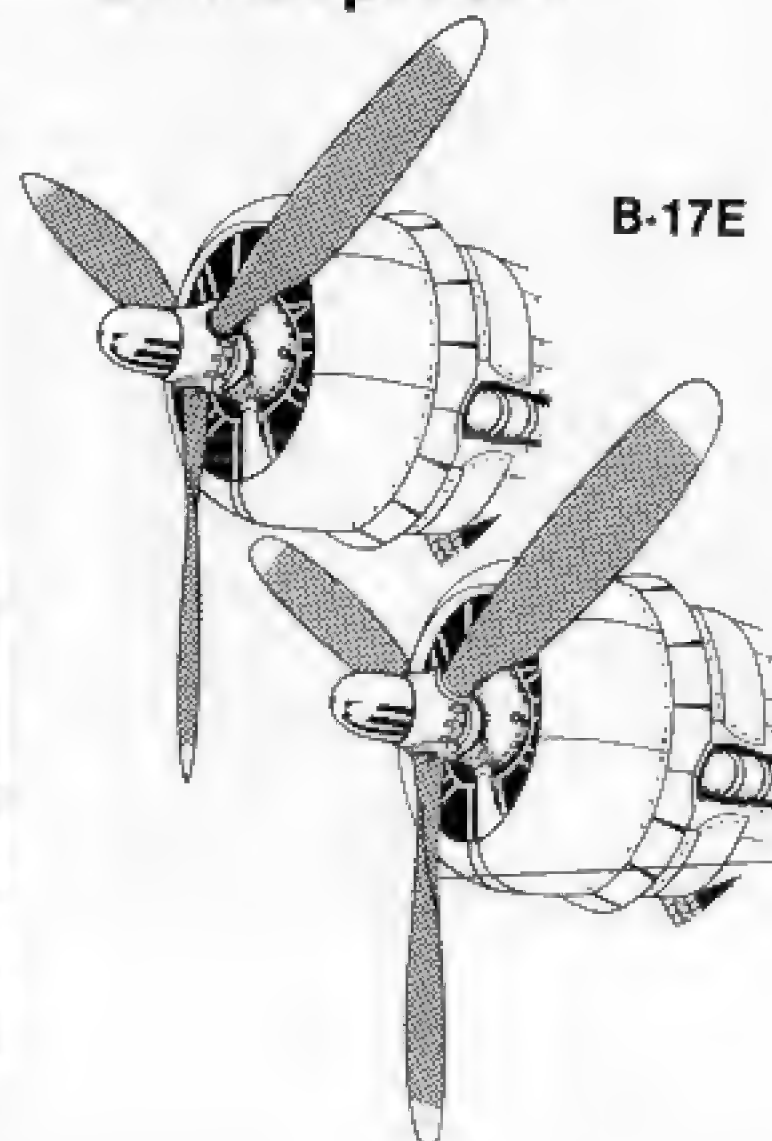


Big Friend and Little Friend. "JOHNNY BOY", from the 301st BGp, and an unidentified P-51B on the ramp at Lucera, Italy, home of the 301st. The close teamwork of fighter escorts and bomber crews eventually broke the back of the defending Luftwaffe day fighters. The P-51B carries D-Day stripes indicating that the photo was taken after 6 June 1944. (AFM)

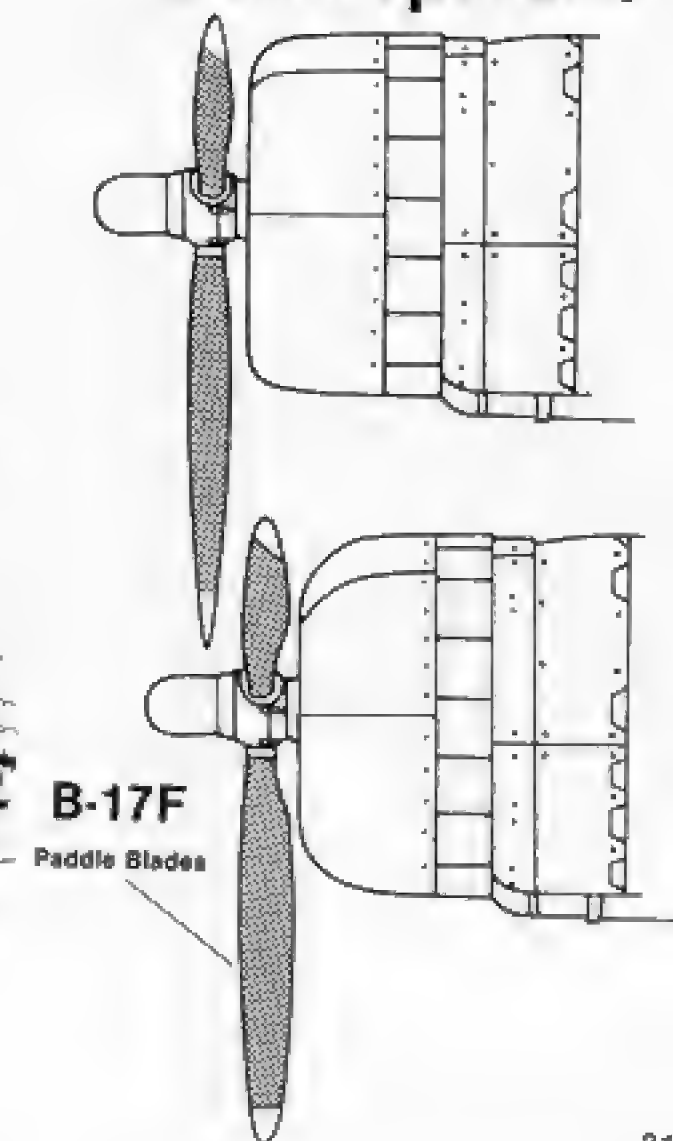
The addition of the paddle bladed propeller and their increased bite made the F series the fastest of the Flying Fortress models. Top speed increased to 325 mph. The Astro Compass dome fairing is silhouetted on SUGAR PUSS's nose.



Propellor Development

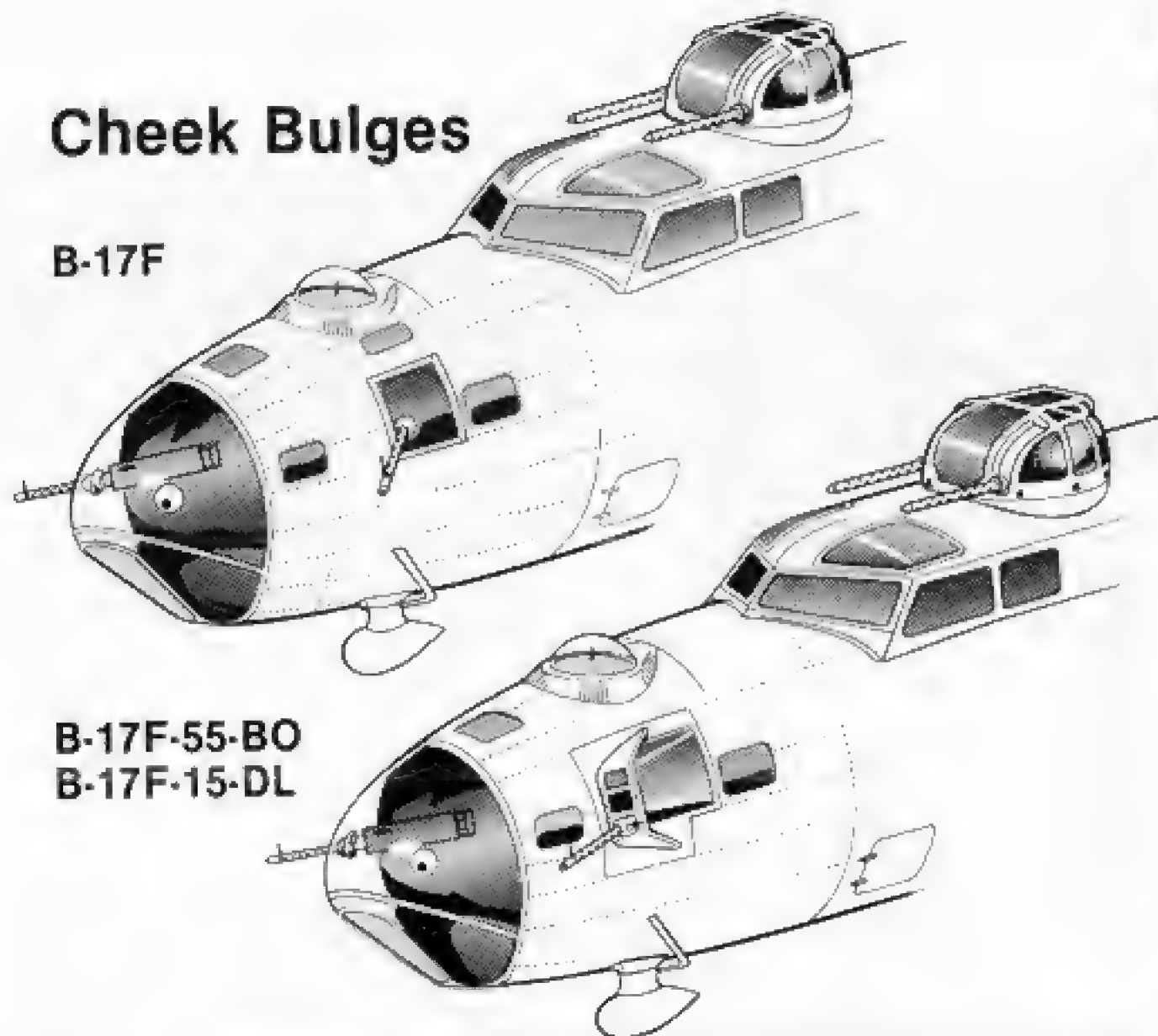


Cowl Development



Cheek Bulges

B-17F



B-17F-55-BO
B-17F-15-DL



"Flak so thick you can walk on it" is encountered by the 457th BGp over Politz in May of 1944. Incredibly, no aircraft were lost on this mission! (AFM)

A Bf 110 Zerstorer breaks away after an attack run on the 91st BGp. Because of its heavy armament the Messerschmitt Bf 110 was particularly effective against Allied Bombers both day and night, however, as soon as the day bombers received fighter protection the Bf 110 had to be withdrawn from the daylight bomber interceptor role. (USAF via Ethell)





"BOMB BOOGIE", B-17F serial 42-5763, from the 91st BGp, has the B-17F intermediate nose configuration with flat cheek gun windows and navigator's astrodome. Note the names of the crews girl friends at or near their positions on the aircraft. (AFM)

(Above Right) "THE SKY HAG" and two other 301st BGp B-17Fs enroute to a target in Italy. "HAG" has the bulged cheek windows. The aircraft carry the Red surround to the national insignia. (USAF via Ethell)

"VIRGIN'S DELIGHT" leads four other 94th BGp B-17Fs on a strike into Germany in late 1943. Note that all aircraft are carrying two 500 lb bombs on external racks in addition to their internal bomb load. (USAF)



YB-40

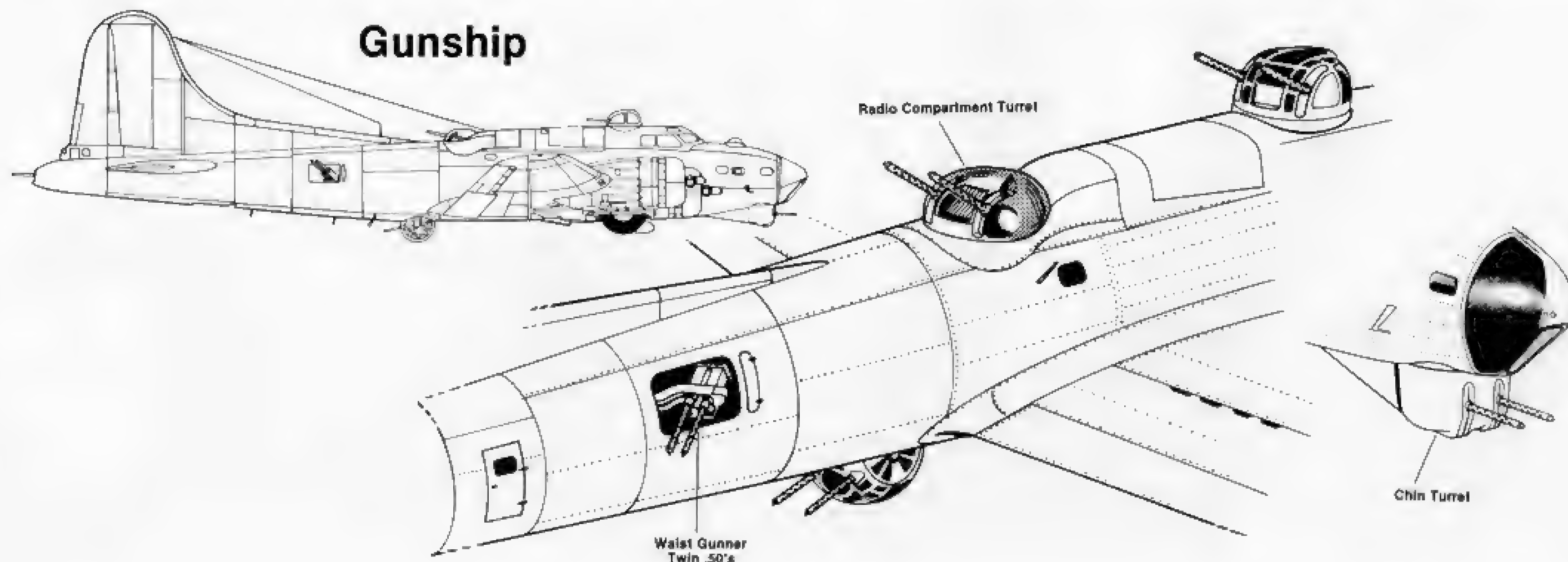
The XB/YB-40 was an attempt by Army Air Force and Boeing to bring additional defensive firepower to the bomber formations flying against Luftwaffe fighters. A standard B-17F was modified with an additional Bendix upper turret mounted in place of the radio compartment guns. Additionally, a twin gun chin turret was mounted and the single waist guns were replaced by twin gun mounts. Both the waist guns and the twin tail guns were hydraulically boosted for better control. Ammunition supplies on the YB-40 were almost triple that of a standard B-17F, 11,275 rounds compared to 3900 rounds on a B-17F. The YB-40s retained full bombing capabilities although seldom used due to the extreme weight of the extra ammunition load.

Although the XB-40 prototype was a Boeing project, all production YB-40s were built by Douglas but identified as Vega-built aircraft! Twenty-three aircraft were built — one XB-40 and twenty-two YB-40s. They were rushed into combat during May of 1943 with the 92nd Bomb Group at Alconbury. Their career came to a quick end when it was discovered that the much heavier YB-40s could not keep pace with the main bomber stream. By August of 1943 all of the YB-40s had been withdrawn from combat. Some of the YB-40 concepts would live on in other B-17 variants, the most notable being the chin turret armament found on late B-17Fs and nearly all of the B-17Gs.

The second production B-17F-1 was converted into the first YB-40 prototype. The conversion involved an additional Bendix power upper turret mounted in the radio compartment, and additional waist guns. With the additional ammunition load, they carried no bombs, the YB-40 was found not to be able to keep up with the bomber stream that they were to protect. The YB-40 program was discontinued in the Summer of 1943. (Garrett)



Gunship





"MAD MONEY II", from the 547th BSq, 384th BGp, has suffered damage in the nose area from an accurate Luftwaffe fighter's cannons. Note the missing cheek window and astro-dome. The patchy appearance of the Olive Drab paint was normal since the English weather quickly deteriorated the paint, ground crews were forced to 'spot paint' these areas. (AFM)

Cincinnati Queen, from the 390th BGp, carries a new-Blue surround to her stars and bars. Note the natural metal leading edges to all flying surfaces caused by removal of the de-icer boots, which would often shred under combat conditions, causing much greater drag on the long flights home. (Ethell)





"HELNO-GAL", one of the famous 'Hell's Angels' of the 91st BGp at Bassingbourne. The 'GAL' was damaged by flak over Berlin on 27 May 1943, but brought her crew home again — a trait common to all B-17 variants. (USAF)

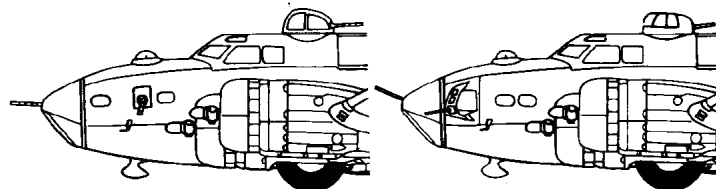
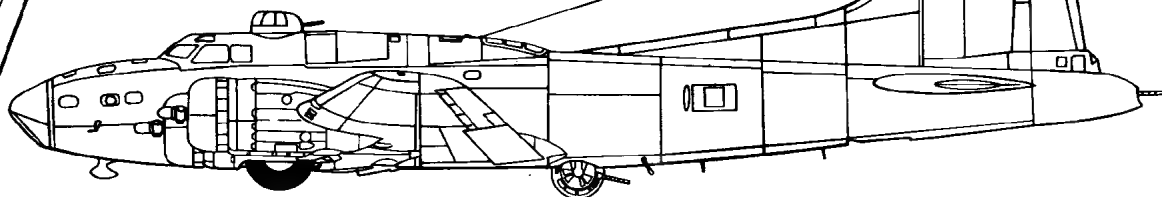
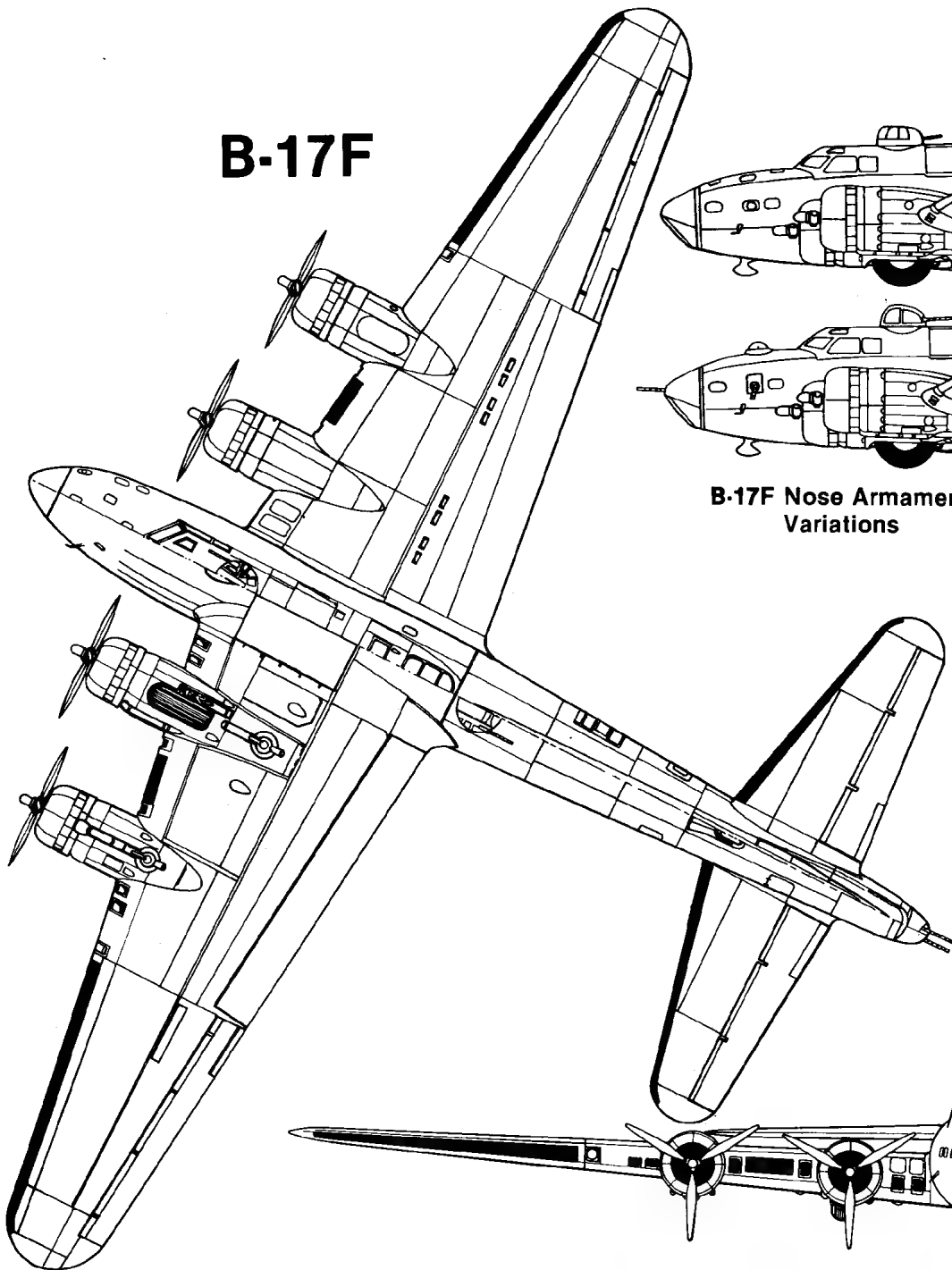


American precision bombing at its best. **"VIRGIN'S DELIGHT"** leaves the Marienburg Focke-Wulf factory in ruins on 9 October 1943. Note the extreme weathering and replacement, or repainted, outer wing panels. (USAF)

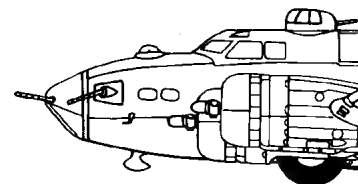
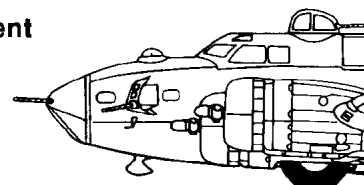
"Knock-out Dropper", B-17F serial 41-24605, from the 359th BSq, 303rd BGp, became the first B-17 to complete seventy-five missions over Europe. The "Dropper" was one of two aircraft from the original deployment to Great Britain in 1942 that survived the airwar and went home again. All the air and ground crew members of the 359th BSq signed the aircraft and it was sent home to join **"MEMPHIS BELLE"** on the War Bond tour. (AFM)



B-17F



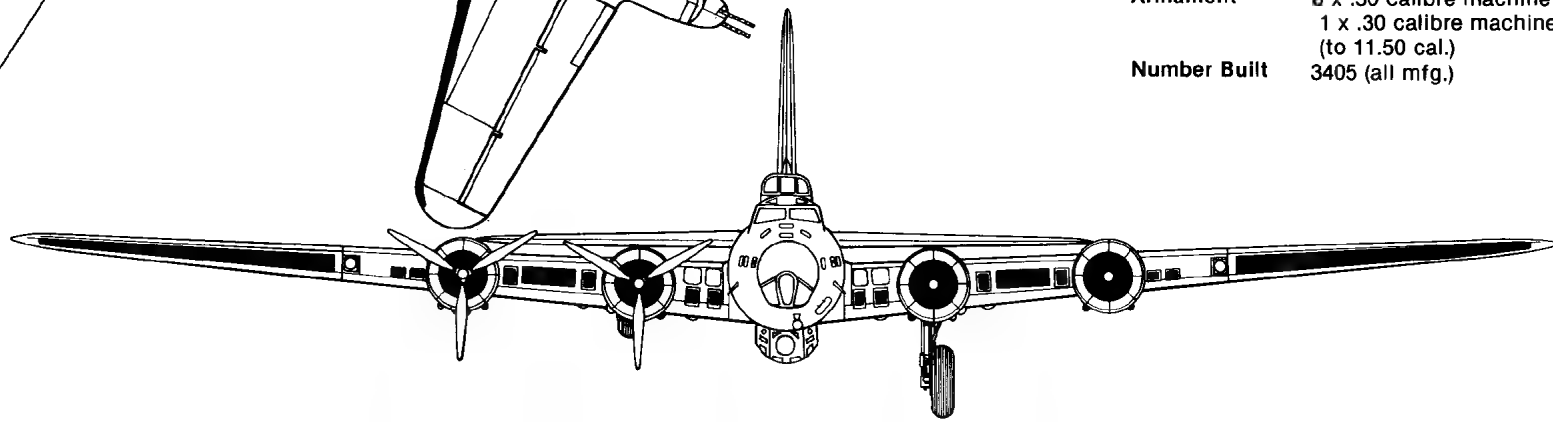
B-17F Nose Armament Variations



Specifications

B-17F

Wing Span	103 ft. 9 3/8 in.
Length	74 ft. 8.9 in.
Height	19 ft. 2.44 in.
Powerplant	Wright R-1820-97 Cyclone 1200 hp takeoff, 1380 hp. War Emergency, 1000 hp @25,000 ft. normal
Empty Weight	35,728
Gross Weight	40,260 lbs.
Cruising Speed	160 mph
Top Speed	325 mph
Ceiling	38,500 ft.
Range	4420 mi.
Crew	10
Bomb Load	8x1000 lb. or any combination to 24x100 lbs.
Armament	8 x .50 calibre machine guns and 1 x .30 calibre machine gun (to 11.50 cal.)
Number Built	3405 (all mfg.)





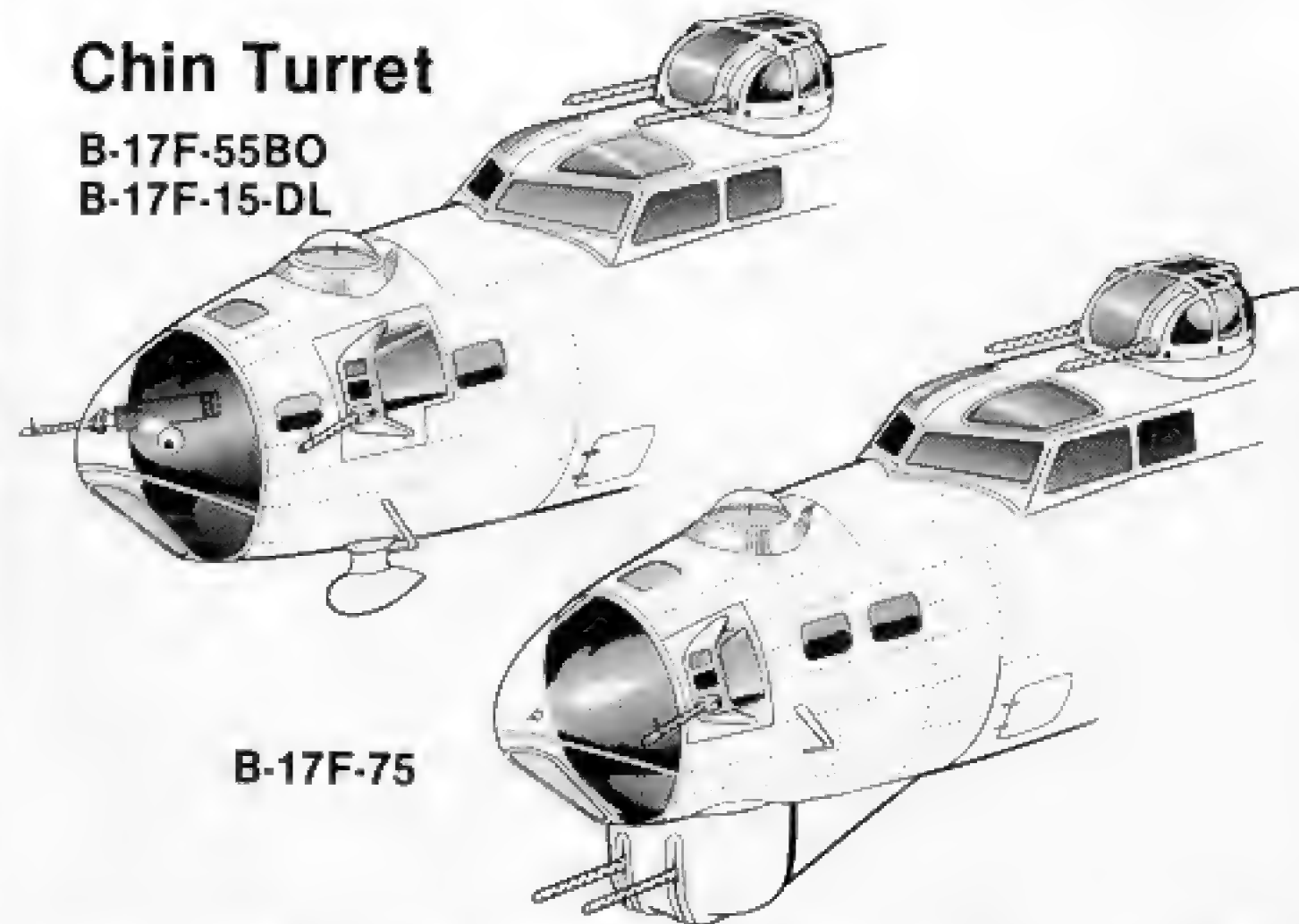
(Above) The Douglas block -75 B-17Fs had Bendix chin turrets mounted under the nose. It was the only major carryover from the ill-fated YB-40 program. (AFM)

A B-17F-75-DL from the 533rd BSq, 381st BGp over the North Sea enroute to a target in Germany. The average viewer could not discern differences between a block -75 B-17F and the early B-17G without checking the serial number; externally they were almost identical. (USAF via Ethell)

Chin Turret

B-17F-55BO

B-17F-15-DL



B-17F-75



A typical scene in the English countryside during World War Two. The bomb dump at Framlingham, home of the 390th BGP. Fins and fuzes will be added to the bombs just before loading into the aircraft. (USAF via Ethell)



B-17G

The B-17G was the most proliferate variant of the Flying Fortress, with 8,680 being built by the members of the B.V.D. pool — 4,035 by Boeing; 2,395 by Douglas, and 2,250 by Lockheed Vega. Basically the B-17G was almost identical to the late B-17F. In fact, some of the early G models were redesignated as Fs. The major distinguishing feature was the addition of the Bendix chin turret, although this feature was found on the last 86 Douglas-built B-17Fs. Many of the early Gs also retained the standard F model nose window configuration and armament. The bulged cheek windows were added beginning with the Douglas block-25, Vega block-35, and Boeing block-60 aircraft.

Various types of waist gun mounts and windows were used throughout the G series with the early G models retaining the side by side waist gun positions. However, beginning with the Boeing B-17G-50-BO, the waist gun positions were staggered so that the gunners would not interfere with each other during the heat of battle. The starboard waist gun position was moved forward three full fuselage frames. The .50 caliber machine guns were on K-6 gun mounts, and the window itself was now completely enclosed keeping the gunners warmer and more comfortable at combat altitudes. Finally, an all new tail turret design was developed by the United Air Lines Modification Center at Cheyenne, Wyoming. The new turret provided much greater gun elevation and included a completely redesigned gunners enclosure with much larger windows. The tail gunner now sighted through a reflector gunsight in place of using the ring and bead type found on earlier B-17 tail gun installations. Known as the Cheyenne tail turret, it was installed on all B-17Gs beginning with the Douglas block-45, Vega block-55, and Boeing block-80.

The B-17G flew for the first time on 21 May 1943, with the first aircraft being delivered on 4 September 1943. On 29 July 1945, the last of the 8,680 B-17Gs rolled off the Vega assembly line. The British Royal Air Force received 85 Fortress IIIs (B-17Gs), which were assigned to both Bomber Command and Coastal Command. Bomber Command's No. 100 Squadron used several highly modified Fortress IIIs for night electronic warfare and pathfinder duties. They had a large chin bubble that housed H2S Bombing Through Overcast (BTO) radar and were used as radar jamming aircraft to help defend the strike force against both German night fighters and anti-aircraft. This same BTO radar, sometimes referred to as 'Mickey Radar', was mounted in place of the ball turret on some Army Air Force B-17Gs. Coastal Command Fortress IIIs had a search radar mounted in place of the ball turret and were used for anti-submarine patrol duties.

Even the Luftwaffe used B-17Gs. Captured Fortresses were used by KG 200 for clandestine operations, transporting agents, dropping supplies behind allied lines, reconnaissance, and the training of fighter pilots in the weaknesses of the Flying Fortress.

The B-17G saw action in three wars after World War Two. The first mission of any type during the Korean War was flown by a SB-17G. The first missions flown over North Korea were flown by aerial mapping RB-17Gs flying from Clark Field, The Philippines. And Israel used three B-17Gs to conduct offensive bombing raids in the 1948 war. These raids were especially interesting since the planes had been delivered to Israel without bombsights or bomb racks. The Israeli crews sometimes dropped the ordnance manually. In the mid-1950s, a couple of all Black B-17Gs were used to drop agents into an obscure little country known as North Vietnam.



The early B-17G retained the nose window configuration of the early B-17F. All nose guns were deleted in favor of the new Bendix chin turret. Note the very unusual B-17F bombardier trainer in the background. (AFM)

Camouflage paint was discarded by Army Air Force in late 1943. The Vega-built block -25 B-17Gs were the first to roll off the assembly line in natural metal. Although combat crews were initially afraid of being singled out by Luftwaffe fighters, no significant increase in losses resulted from the natural metal finish. Note the anti-glare panels on the inside of the engine nacelles. (AFM)





A lineup of brand new B-17G-45-BO Fortresses on the ramp of Boeing Field early in the Spring of 1944. (AFM)

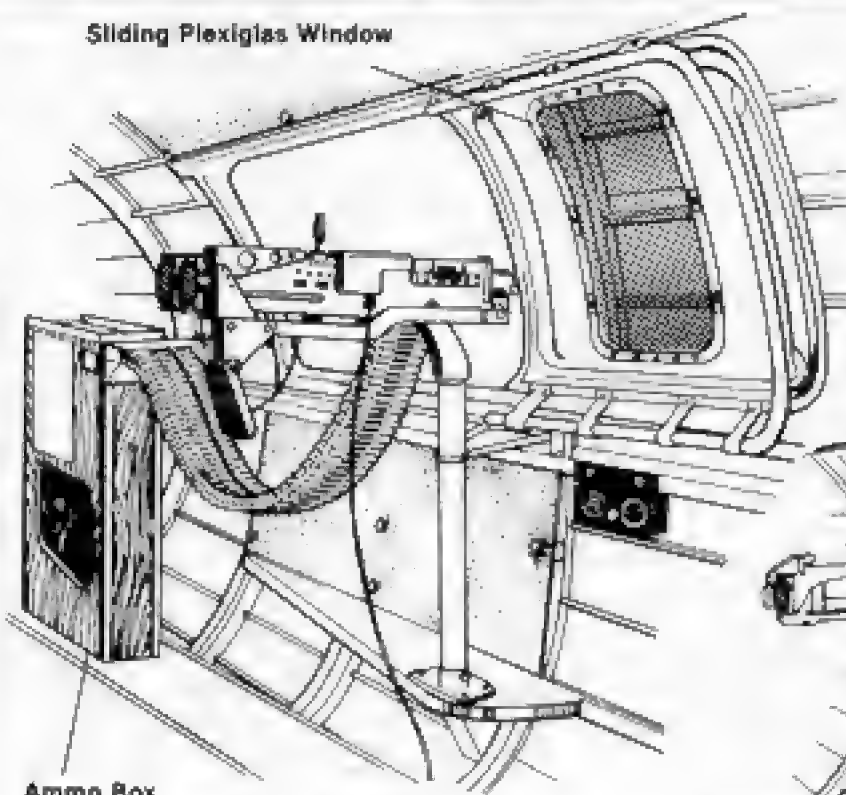
The 381st BGP during the long flight to a target deep inside Nazi Germany. A typical flight to Berlin and back was often over 8 hours in length. Note the extreme paint weathering on MS*X, and the cheek guns on VE*M, which were reinstated at blocks -60-BO, -35-VE, and -25-DL. (AFM)



Sliding Plexiglas Window

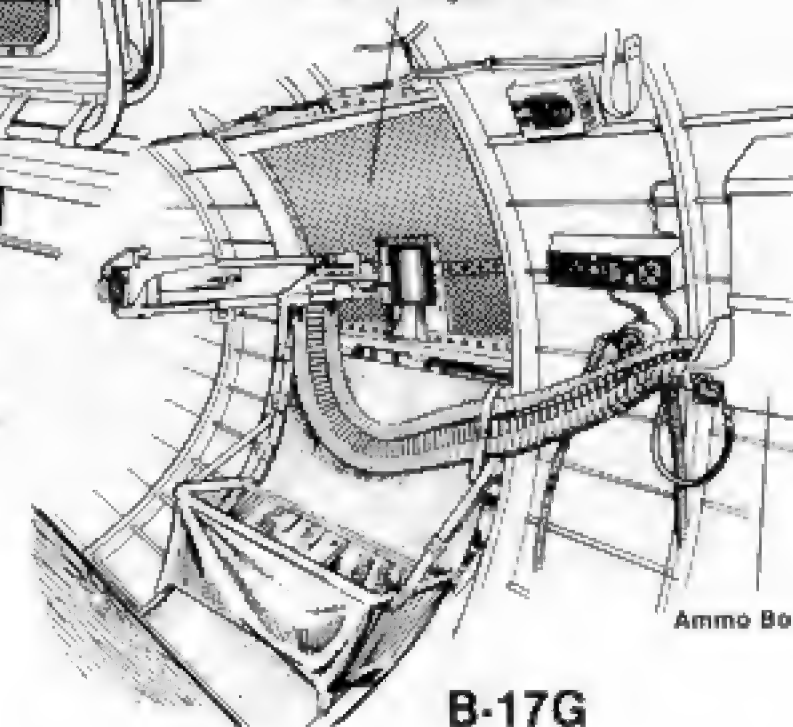
Waist Gun Positions

Sealed Plexiglas Window



Ammo Box

B-17E/F

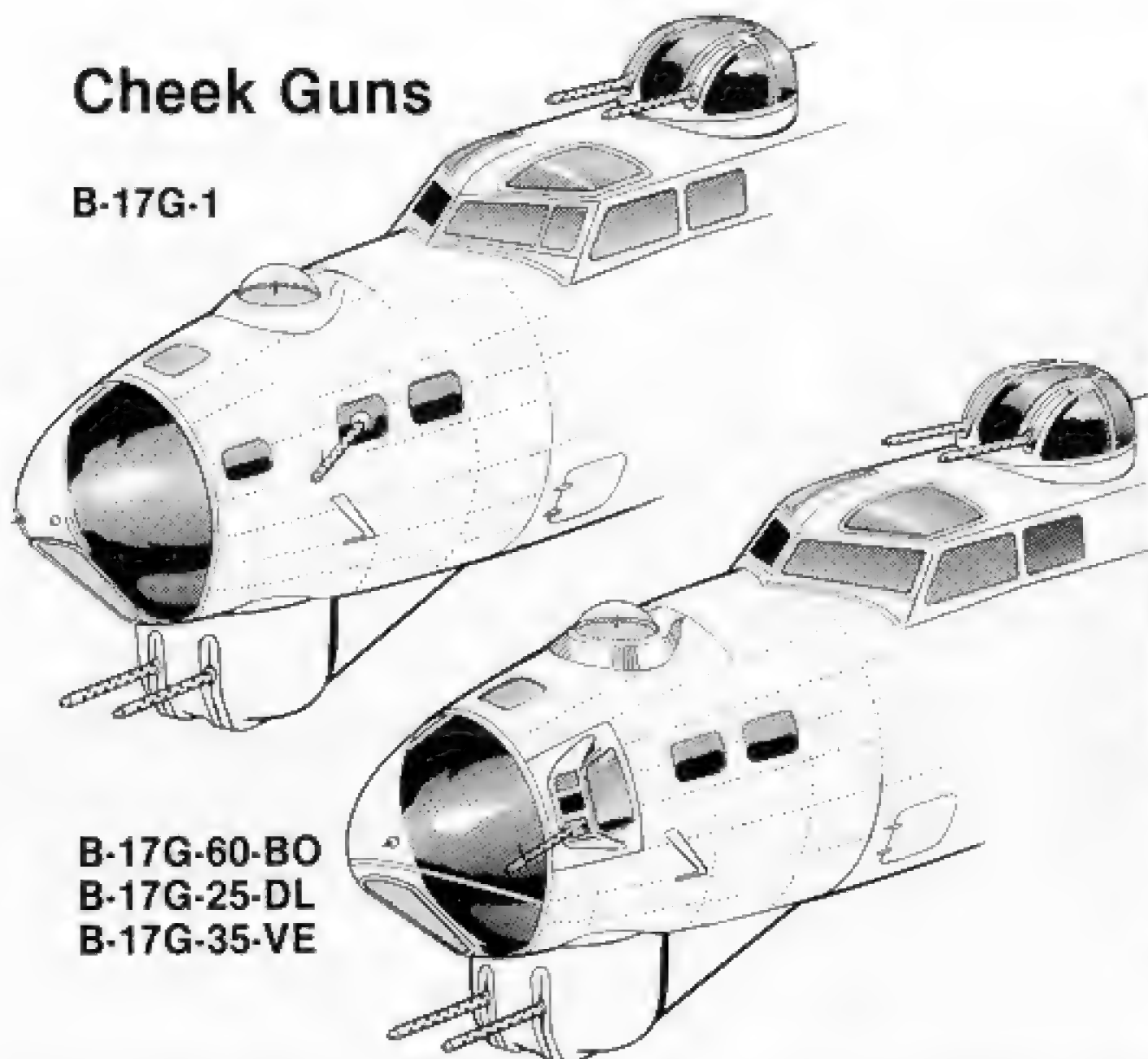


Ammo Box

B-17G

Cheek Guns

B-17G-1



B-17G-60-BO
B-17G-25-DL
B-17G-35-VE



The bulged cheek gun windows were added to the G series beginning with Douglas block -25, Vega -block-35, Boeing block -60. This machine was the 3500th aircraft to be run through the United Air Lines modification center. The United Air Lines Modification Center at Cheyenne, Wyoming was responsible for updating 5,534 B-17s between 1942 and 1945, their most famous modification being the Cheyenne tail turret. (UAL via AFM)

"QUAD ZERO" from the 324th BSq.91st BGp. Note that the ball turret has been swung 90 degrees to the vertical, which brought the entry door of the turret within the aircraft. It was the only way the ball turret gunner, almost always the smallest member of the crew, could enter or exit the ball turret. (USAF)





"2nd Patches" being escorted by a pair of 325th FGp P-51Bs on a shuttle mission to Russia. Shuttle missions to Russia were flown from both English and Mediterranean bases. At times, a mission would take off in Africa, shuttle to Russia then fly from Russia to England, and then shuttle back to its home base in Africa — bombing a different target on each leg of the triangle. (USAF)





Another Fortress brings her crew home safe although the aircraft itself is mortally wounded. The Air Force photographer has caught this 525th BSq B-17G-80-BO just as its tail touches the grass at Kimbolton. (USAF via Ethell)

(Right) Not all the artwork was on the aircraft. Many crews had their aircraft name, artwork, and missions flown, painted on their leather flight jackets. "Rosie's Sweat Box" flew with the 401st BGp in the Summer of 1944. (USAF)

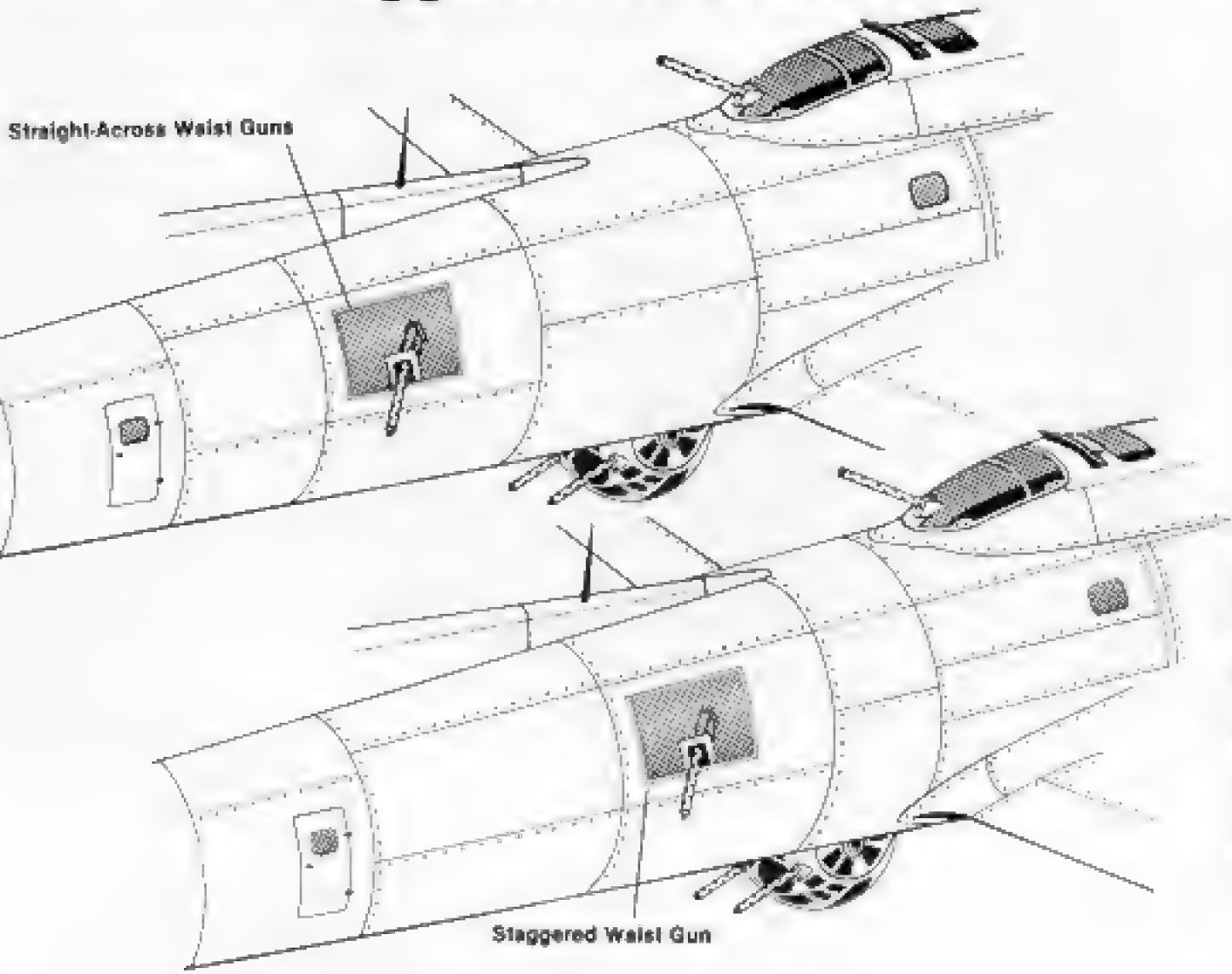
The 401st BSq sits on the taxiway awaiting the Bassingbourne tower clearance to take off. During takeoff and landing, the ball turret was always unmanned. It was a hairy ride indeed, when the ball turret was jammed in flight with the gunner inside. (USAF via Ethell)





The moment of truth! A 306th BGp B-17G drops ten 500 lb bombs on a German target. The Norden bomb sight computed the exact moment of bomb release, then automatically released the bombs when that point was reached. (AFM)

Staggered Waist Gun



SHADY LADY force landed nearly intact, providing the Germans with an additional B-17G for their small but growing Fortress fleet. Heavily camouflaged to prevent allied fighters from destroying it, the hapless machine waits for its new masters to collect it.

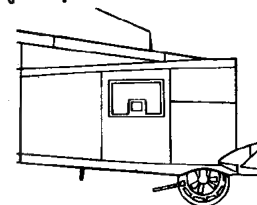
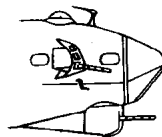
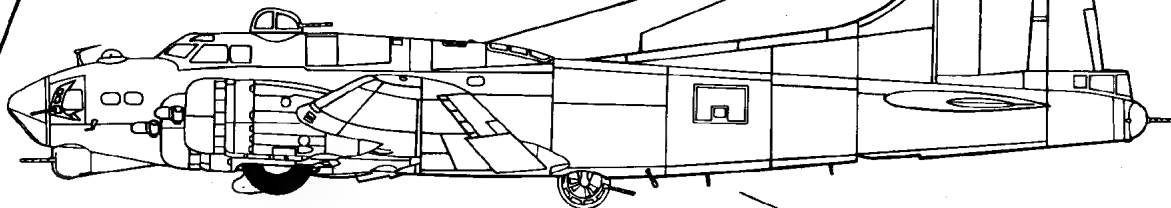
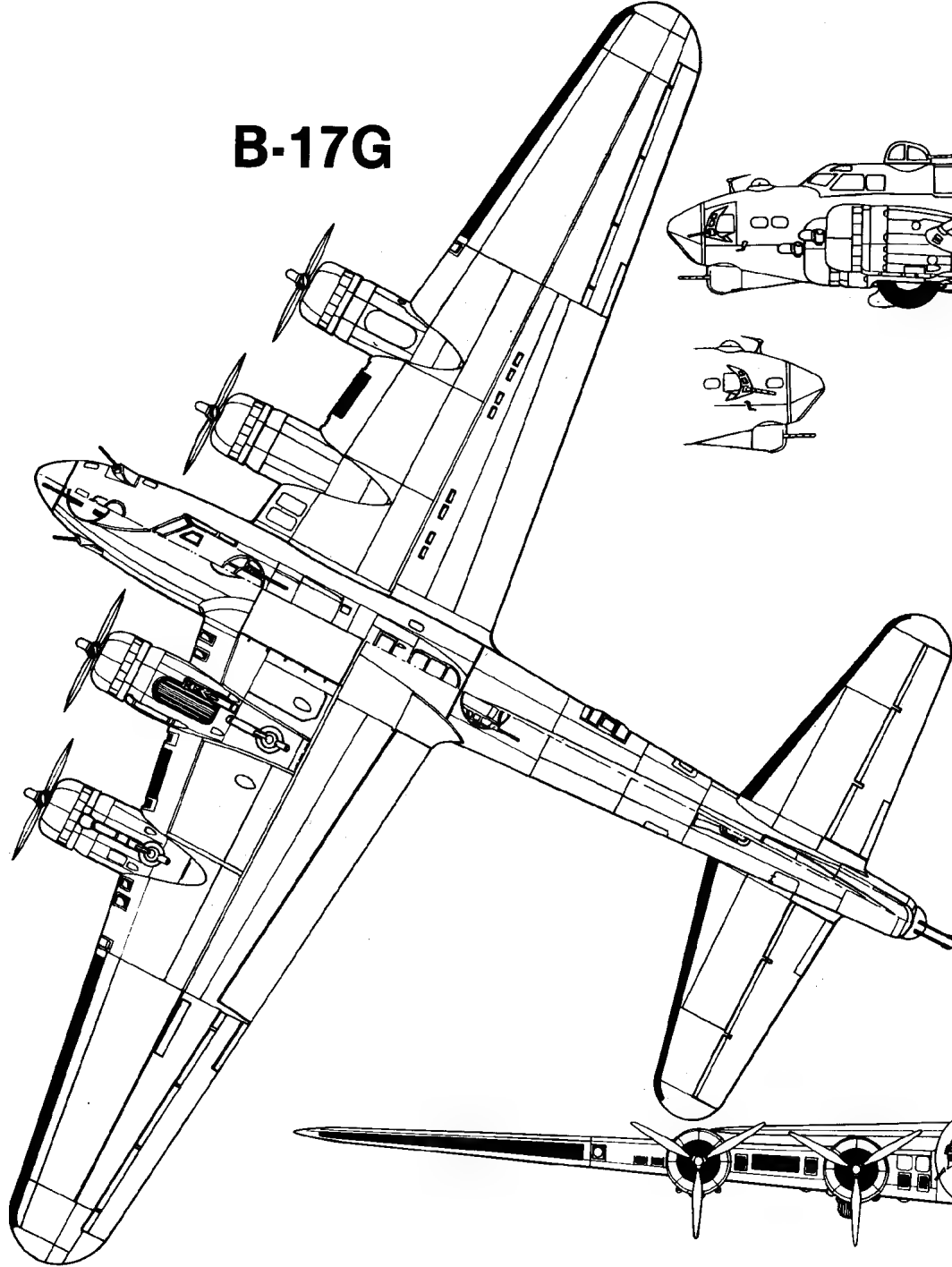
Armorers change the chin turret machine guns on a 525th BSq B-17G. The gun sight hangs from the upper lip of the nose, directly over the bomb sight. Turret controls and triggers were on a movable yoke that swung to the right when not in use so as not to interfere with the bombardier during the bomb run. (USAF via Ethell)





Close examination of the two photos will reveal the differences between the standard B-17G with straight across waist gun positions (left), and the later staggered waist gun positions (above). The staggered waist positions were introduced on blocks -50-BO, -50-VE, and -25-DL. In the left photo, a heavily weathered 452nd BgP Fortress passes almost directly over Tempelhof Airdrome after releasing its bombs on a Berlin target on 29 May 1944. The 98th BgP B-17G in the above photo appears to be a brand new aircraft as evidenced by the retention of the de-icer boots and overall shiny appearance, which deteriorated quickly in the English weather. (Ethell)

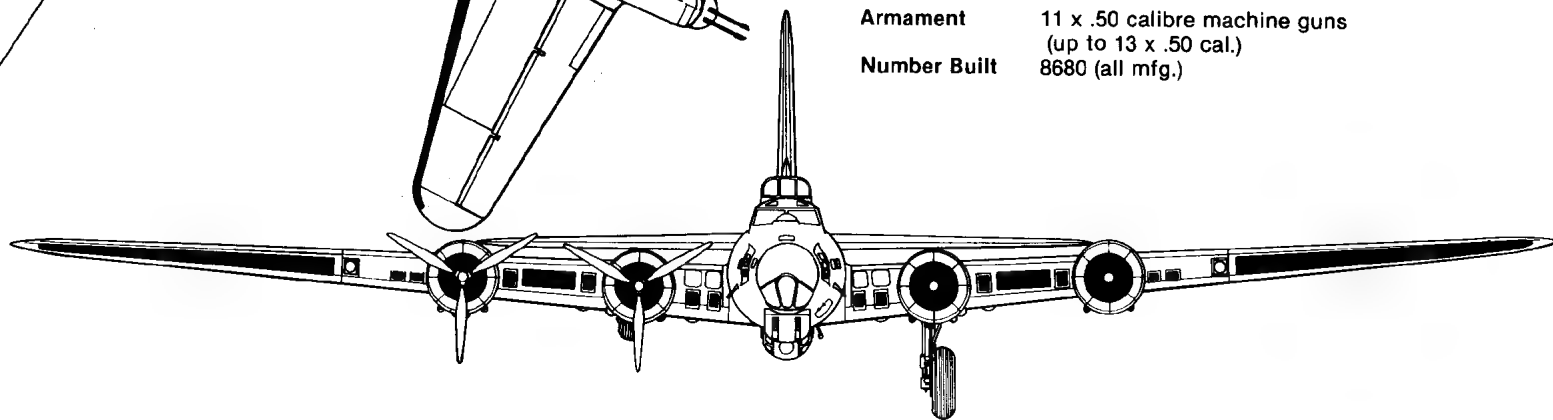
B-17G



Specifications

B-17G

Wing Span	103 ft. 9 3/8 in.
Length	74 ft. 3.9 in. ("Cheyenne" Tail)
Height	19 ft. 2.44 in.
Powerplant	Wright R-1820-97 Cyclone with 1000 hp @ 2300 rpm @ 25000 ft.
Empty Weight	36,134
Gross Weight	40,260 lbs.
Cruising Speed	160 mph
Top Speed	302 mph
Ceiling	36,400 ft.
Range	3750 mile
Crew	10
Bomb Load	6x1600 lbs. and 2x4000 lbs.
Armament	11 x .50 calibre machine guns (up to 13 x .50 cal.)
Number Built	8680 (all mfg.)



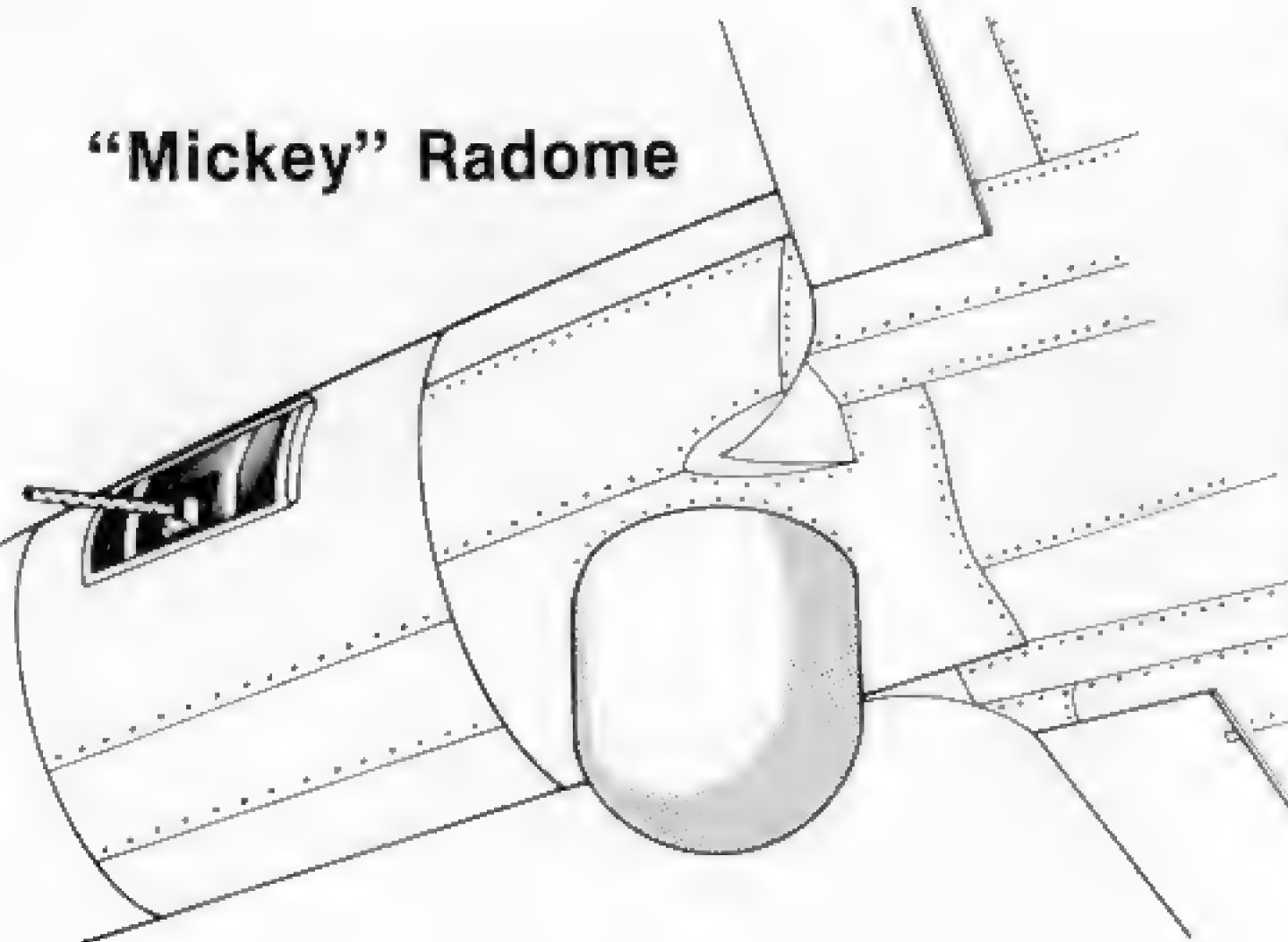


(Above) "HIKEN FOR HOME" carries the Red tail band and triangle A of the 91st BGp. Note the rather common practice of each crew member painting his girls name near his position in the aircraft; or on an engine nacelle in the case of a ground crew member. (Cornell via Taylor)

"DUCHESS' DAUGHTER" comes to an abrupt halt on the 303rd BGp runway at Molesworth. Although the damage appears extensive — smashed nose and turret, crushed engine nacelles, damaged bomb bay doors, and crushed ball turret - the aircraft returned to action a few weeks later. 8th Air Force ground crews often performed near miracles in salvaging damaged aircraft. (AFM)



“Mickey” Radome

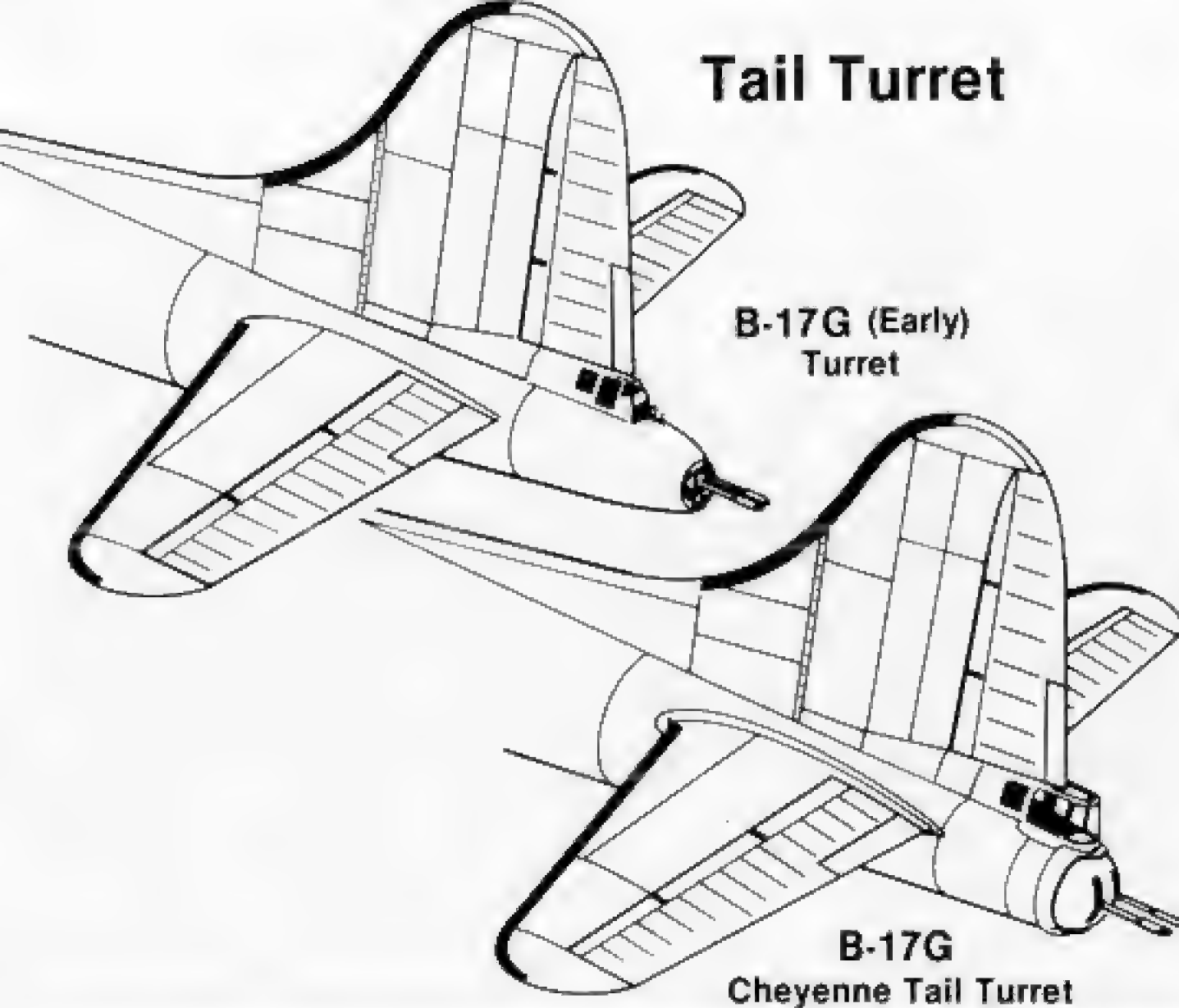


Two 413th BSq, 96th BGp B-17Gs with their BTO radar domes in the extended position. The BTO radar, sometimes referred to as “Mickey radar”, was mounted in the ball turret position and used the same mechanism to raise and lower the radome that had powered the ball turret. BTO radar made Hitler’s Festung Europa subject to precision bombing attacks even through the worst weather, which usually grounded the Luftwaffe, resulting in lighter bomber losses. (Ethell)

A 384th BGp B-17G-10-DL from the 100th BGp, equipped with the AN/APN Bombing Through Overcast (BTO) radar dome. The dome is in the retracted position. (Balogh via Menard)



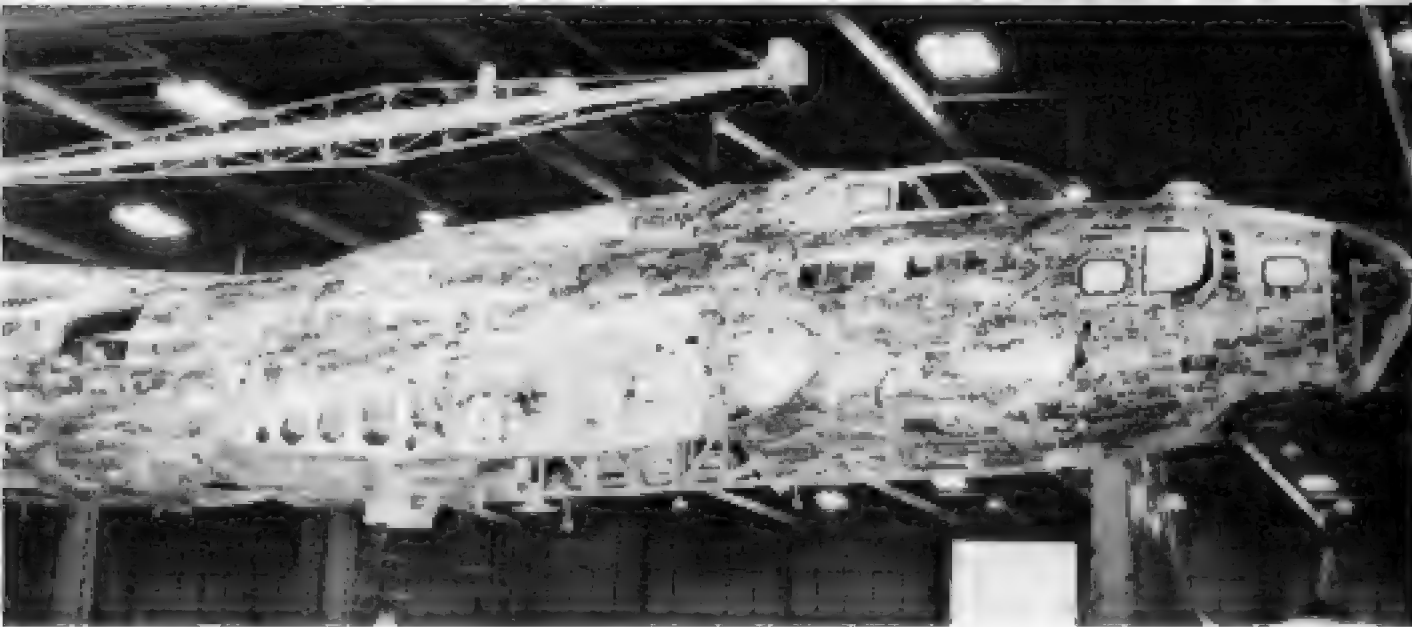
Tail Turret



A 97th BGp B-17G-30-BO returns to Manduria, Italy after a Bf 110 rocket attack punched a big hole in the rudder during the bombing of the Steyr ball bearing plant in Austria. This aircraft is equipped with the Cheyenne tail turret although the modification was not available until the block -80-BO aircraft. (USAF via Ethell)

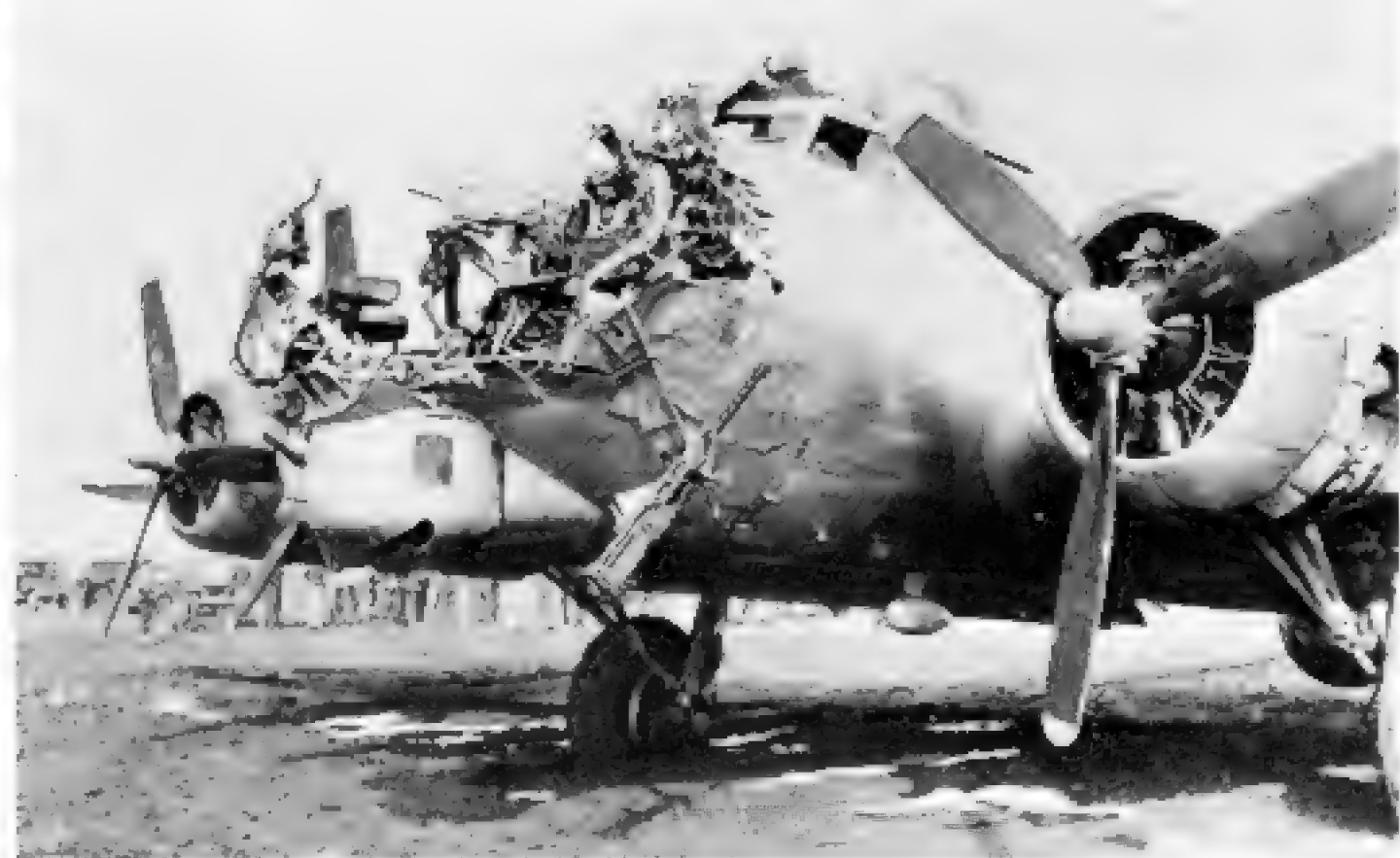
A B-17G from the 401st BGp enroute to Germany in 1945. Again, the aircraft is from an early block B-17G and has had the Cheyenne tail turret retrofitted, probably at the Cheyenne UAL Modification Center. The tail band is Yellow with Black trim, while the Group marking is a Gray triangle with a Blue S. The small Red P on the color band is a plane-in-squadron identifier. (AFM)





The first flight of the famous '5 Grand', the five thousandth B-17 built by Boeing, and signed by everyone that worked on her in any way — some 35,000 names. "5 Grand" flew 78 missions with the 96th BGP, carrying all the names on each mission. She was to have been a permanent memorial in Seattle but ended her career with other, equally famous B-17s, in the scrapyard at Kingman, Arizona. (AFM)

When the bomb bay doors on this 347th BSq, 99th BGP B-17 jammed, the bombardier was unaware of the problem. Arriving over the target, the Tordinone Bridge in Northern Italy, the bombardier dropped his bombs THROUGH the bomb bay doors, seen bulged out below the wing. The aircraft is a B-17G-50-DL with the staggered waist gun positions and Cheyenne tail turret. (USAF via Ethell)



(Above) Another example of why the Fortress crews loved the aircraft — it seldom quit, no matter what the damage. This 398th BGP aircraft survived a direct hit by an anti-aircraft artillery shell over Cologne, and brought its crew home to Nuthampstead. The bombardier and navigator were killed instantly. (AFM)





(Above) "BLOOD N' GUTS", a Vega-built G-60 of the 401st BSq, carrying the Red vertical and horizontal tail and Red wingtips of the 91st BGp. The Red and White stripes around the aft fuselage indicate a Lead Bomber. (USAF)

"OLD BATTLE AXE", another 91st BGp B-17G, this time from the 323rd BSq. A G-75-BO, the "Axe" represents the ultimate B-17 design — chin turret, bulged cheek guns, staggered waist gun positions, and Cheyenne tail turret. Note that the tail code, a Black triangle with a Grey A, is repeated on the upper starboard wing.(USAF)



B-17H and other major variants

The B-17H was a specially modified B-17G for use in the air-sea rescue role. Used by Air Rescue service from 1945 through 1956, the H carried a 27 foot long, 3,500 lb lifeboat under the forward fuselage. Because their role often brought them deep into enemy territory in search of downed airmen, the B-17H initially retained full armament with the exception of the ball turret. With the close of World War Two, armament was gradually done away with. The chin turret was the first to go when Army Air Force decided to add a search radar to the aircraft. The radar was mounted in a radome very similar to the BTO radar found on B-17Gs, with the radome replacing the chin turret. The other weapons were eventually deleted to decrease weight and increase the aircraft's effective range.

This all changed in June of 1950 when the Communists attempted to take South Korea by force. B-17Hs, now designated SB-17 for Search Bomber, from the 2nd and 3rd Rescue Squadrons based in Japan, were the only air rescue aircraft available to Far East Air Force. With missions carrying them within the reach of Red interceptors, the SB-17s were again armed with cheek guns, top turret guns, and tail guns. Boeing had converted a total of 180 B-17Gs to B-17H specifications for the Army and Navy air forces. The Navy designated them as PB-1G. The SB-17 was rapidly replaced by SB-29 Dumbo aircraft when the MIG-15 made its appearance in November of 1950.

PB-1W Airborne Early Warning

The PB-1W was a Navy variant of the B-17G used for long range anti-submarine patrol. Most of the PB-1Ws had search radar mounted in a large bubble under the nose. However, some aircraft had the bubble mounted atop the fuselage, which became standard on later airborne early warning and antisubmarine aircraft such as the Lockheed EC-121.

QB-17 Remote Control Drone

The QB-17 was a remote piloted drone aircraft initially used in the Bikini atomic bomb tests to check the effects of the nuclear blast on an aircraft's flying characteristics and equipment. Later, in the 1950s, QB-17s were used as targets for Air Defense Command gunnery meets, and in the testing of a new generation of air to air missiles such as the Sidewinder. QB-17s were some of the most colorful aircraft in the Air Force, painted in Yellow with Black stripes, which sometimes covered the entire aircraft. Controller aircraft for the QB-17 drones were designated DB-17.

RB-17 Reconnaissance Bomber

There were actually two totally different RB-17 designations. The first "R" designation came during the early years of World War Two when any B-17 considered unworthy for combat, was given the designation RB-17 for Restricted flight. The later "R" designation was for Reconnaissance B-17s, which had previously been designated F-9 (Foto) prior to 1948. It was an RB-17G that flew the first mission of the Korean War on 25 June 1950, when a photo-mapping mission of North Korea was flown by a 6204th Photo Mapping Flight RB-17G.

VB-17G VIP Transport

The VB-17G was a B-17G, stripped of all armor and armament, and refitted with very plush interiors, including full office and sleeping quarters. They were used by high ranking officers of all the major services. Many VB-17Gs saw service in Korea, where they were re-armed with the top turret and tail guns. VB-17s operated throughout the 1950s in this role and were some of the last Flying Fortresses to be retired.

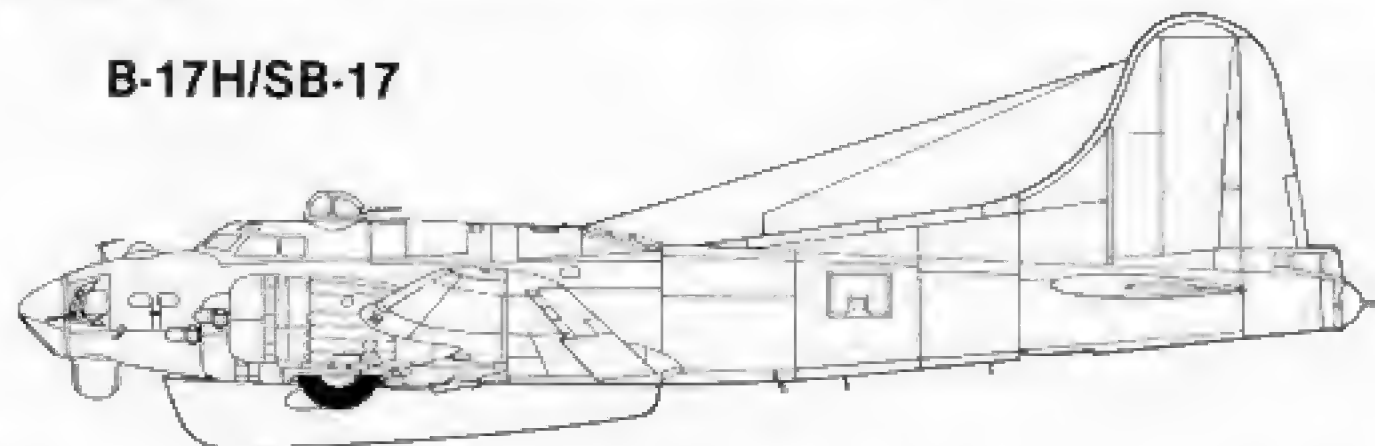
TB-17 Trainer

The TB-17 was a trainer version of any B-17 variant.



"PACIFIC TRAMP", a B-17H from the 6th Emergency Rescue Squadron on Ie Shima. Some 130 B-17Gs were converted to the search and rescue configuration with the addition of a droppable boat and Air to Surface Vessel radar mounted in a pod in place of the chin turret. (Garrett)

B-17H/SB-17



Close up of the ASV radome and the 3500 lb, 27 foot long life boat. The boat had two motors, full sails, navigational equipment, heavy clothing and blankets. It could carry ten men, and had food and fuel for up to a 700 mile trip. (USAF)





(Above) In 1948, Congress made the United States Air Force a separate branch of the military. At that time, the Air Force changed many aircraft designations. Pursuit planes became F for Fighter and the B-17H became an SB-17G for Search Bomber. This SB-17G is from the 10th Rescue Squadron based in Alaska. Note that all armament has been deleted by this date — 1949. (USAF)

The B-17 went to war again in 1950 when the North Korean Communists struck across the 38th Parallel, beginning the three long years of the Korean War. SB-17Gs, such as this 3rd RSq aircraft, went on every mission that crossed major water areas such as the Yellow Sea. This aircraft is about to touch down at Ashiya Air Base after having dropped its boat to an Allied aircrew down in the Sea of Japan. (USAF)





(Above) B-17s were used for a variety of missions other than combat. This B-17G is assigned to the Navy and was used as an air launch platform for the JB-2 Loon guided missile. JB-2 was the US designation for captured German V-1 Buzz Bombs. (Olmsted)

The QB-17G was a drone aircraft used for a variety of missions. Several were used in the Bikini Atomic tests to test results of an atomic blast on a flying aircraft. Others were used as targets in the testing of air to air missiles such as the AIM-9 Sidewinder series. QB-17s were quite colorful as evidenced by this Wright Air Development Center aircraft in overall Yellow with Black stripes. (Menard)





(Above) Many B-17s were converted into plush flying offices for high-ranking officers. Designated VB-17Gs, they were equipped with everything imaginable, including the proverbial kitchen sink. This aircraft belonged to Major General Glenn O Barcus, CO of 5th Air Force Fighter Command in Korea.

This B-17G was involved in the Vietnam War, albeit very early in the conflict. An RB-17G, serial 44-85531, the aircraft was used to drop agents into North Vietnam in the middle 1950s. Seen here at Clark AB, The Philippines, in her all-Black paint scheme, the aircraft carried two three-digit numbers on a slide-in tray on her tail — 531 and 639. A B-17 was chosen for the mission because “the Vietnamese thought it did not look like an American aircraft!” (Olmsted)





A CB-17G belonging to the US Ambassador to Canada. As plush as their VB-17 counterparts (note the curtains on the waist windows), the CB-17G had extensive radio equipment to maintain constant contact with Washington. (Balogh via Menard)

The US Navy had many B-17s under the designation PB-1. All were ex-Army aircraft that were specially modified for the Navy mission. The PB-1W was an anti-submarine aircraft with a large ASV radome in the bomb bay area. (Balogh via Menard)



A portent of things to come. The gigantic all-jet Boeing YB-52 Stratofortress meets its predecessor, a Flying Fortress. (Menard)



USAAF In WWII

from squadron/signal



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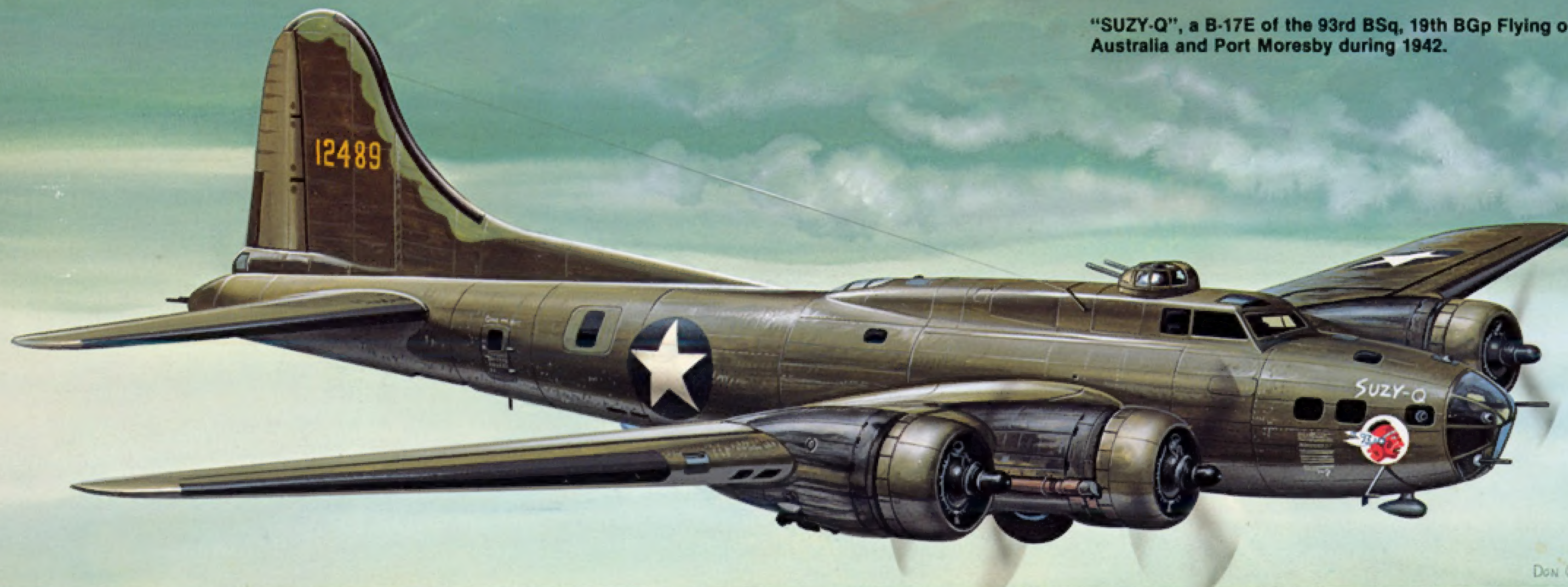


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squadron/signal publications

"SUZY-Q", a B-17E of the 93rd BSq, 19th BGp Flying out of Australia and Port Moresby during 1942.



"BLOOD' N GUTS", a B-17G-60-VE a lead bomber from the 401st BSq, 91st BGp at Bassingbourne in Spring 1945.



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